ECHNOLOGY DEPARTMENT

ROADS AND STREETS

WAYS BRIDGES
AIRFIELDS
CONSTRUCTION

FEBRUARY 1949

BLIC LIBRARY
FEB 22 1949
DETROIT

Limestone quarry of the Ralph Rogers Company, Franklin, Tenn. Drilling equipment comprises 2 wagon drills, 2 pneumatic hammers, and one 500 cu. ft. compressor.

Why this large paving contractor uses TIMKEN® Rock Bits

The Ralph Rogers Company of Franklin, Tenn., operates a limestone quarry in connection with the production of asphalt aggregate.

Rock drilling at this quarry is a 100% Timken rock bit operation because the quarry operator has found Timken rock bits superior in performance and more economical in use than the bits previously used.

Furthermore, by preventing the steel from bottoming in the bit, the Timken one piece, solid steel shoulder construction has eliminated drill steel breakage that previously was a source of delay and expense.

No matter where you are, there's a Timken rock bit distributor within telephone call. Conversion and reconditioning shops also are conveniently located for quick service. Put Timken rock bits to work now; cut drilling costs, increase production.

TIMKEN
ROCK BITS

THE TIMKEN ROLLER BEARING COMPANY, CANTON 6, OHIO - CABLE ADDRESS "TIMROSCO"

SPEED

— to clear at 20-30 mph.

— to throw snow off the road

— to clear more miles per hour

STAMINA

— to operate on 24-hour schedules

— to buck thru deepest drifts

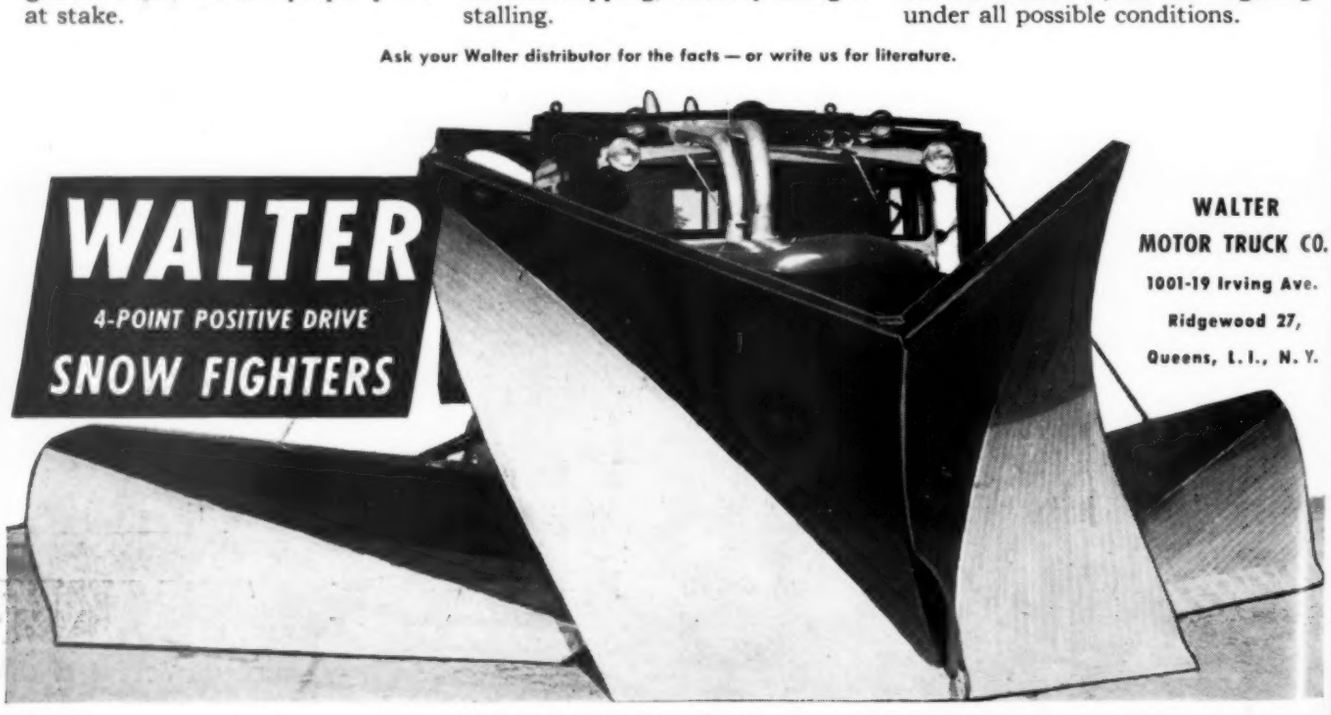
— to cut down high windrows

WALTER SNOW FIGHTERS, with their great speed, power and traction, not only open your roads fast —but they have the ruggedness and reserve ability to keep battling without fail, day and night, until the job is done. This Walter dependability is vital in winter emergencies where life and property are at stake.

Walter Snow Fighters clear faster because of their great engine power (240-250 hp.) and the unfailing 100% traction of the Four-Point Positive Drive. This provides maximum plowing speeds for pouring snow, opening drifts or travelling slippery surfaces and grades, without side-slipping, wheel spinning or stalling.

The ruggedness of Walter Snow Fighters results from their special, scientific construction for snow removal, including larger gear capacity, tractor type transmission, powerful chassis, high-capacity plows and wings, special hydraulic controls and other accessories essential to efficient, safe snow fighting under all possible conditions.

Ask your Walter distributor for the facts — or write us for literature.

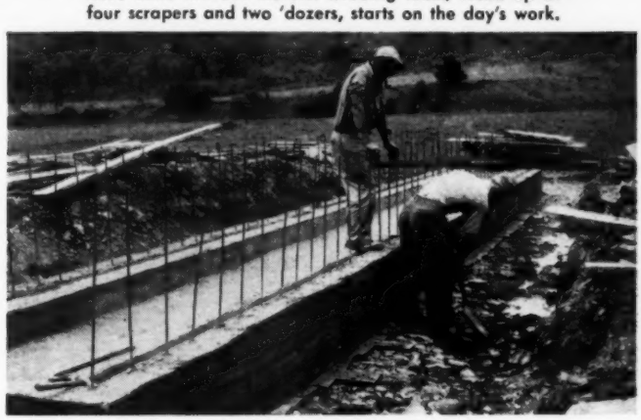


WALTER MOTOR TRUCK CO.
1001-19 Irving Ave.
Ridgewood 27,
Queens, L. I., N. Y.

6-Mile Paving Job on N.Y. Route 17

Here come the dirt movers. Grading team, made up of four scrapers and two 'dozers, starts on the day's work.

New York State Highway Department engineers go into a huddle. Left to right: Thomas J. Cornell, bridge engineer; John C. Crawford, detail engineer; and R. P. Berlureau, engineer in charge.



Bethlehem Reinforcing Bars shown in place in culvert. Project used 25 tons of reinforcing steel.

In order to make Route 17 straighter and safer, the New York State Highway Department authorized six miles of new construction between Jasper and Addison. The new highway is two lanes wide, and is relatively free of turns and grades. It was constructed by Potter DeWitt Corp., of Pavilion, N. Y. Steel items supplied by Bethlehem were bar mats, reinforcing bars and cable guard rail.

Easy does it! Workmen carefully gauge distance to road form before placing Bethlehem Bar Mat.

Batch-bucket shuttles back and forth endlessly, as it drops new concrete over Bethlehem Bar Mats.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Guard Rail Posts Bar Mats • Guard Rail • Wire Rope and Strand Hollow Drill Steel • Spikes • Bolts and Nuts • Pipe Sheet- and H-Piling • Fabricated Structural Steel Timber Bridge Hardware • Tie-Rods

BETHLEHEM STEEL

ROADS AND STREETS

February, 1949 • Vol. 92 • No. 2

With Roads and Streets Have Been Combined Good Roads Magazine And Engineering & Contracting

Coming Articles

Beginning in May

New "Roadbuilders at Work" series of Editorial Reports by the R & S editors. Each month a 12 to 16 page compilation of fresh data on some practical phase of construction, maintenance, operation. More details next month.

In March and April

Fast Jobs of '48: A new batch of contractor performance dope. One "terrific" project, for example, utilized 80 trucks on base stone.

Contractor Topics: Timekeeping vs. Costkeeping . . . More on "What Makes a Contractor Tick" . . . How California Contract Costs Have Soared (and played hob with the road program) . . . How Safe is the Drinking Water on Your Jobs?

Bridges: Beginning a picture parade of some of the best recent state highway bridges . . . A deep pile foundation for this F.A. secondary bridge in Michigan . . . A concrete arch job described.

Grading: How a Small Community Got an Airport "For Free" in a Single Week End . . . 1,300,000 yds. per Month at Cherry Creek Dam.

Maintenance: How Minnesota Puts Contractors' Idle Equipment at Work on Ice Removal and Winter Maintenance . . . Cement Slurry Methods Used on Indiana US 30 for Undersealing.

Design and Planning: Kansas' Flexible Road Design Formula Analyzed . . . Latest Techniques of Measuring and Selling a State's Long Range Highway Needs.

Rock Excavation: Blasting Close to a Parallel Rail Line . . . TNT Used on This Project.

Urban: Pittsburgh's Expressway Program.

HAROLD J. McKEEVER, Editor

C. T. MURRAY, Managing Editor

H. K. GLIDDEN, Contributing Editor

COL. V. J. BROWN, Consulting Editor

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A magazine devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations, and to the construction and maintenance of airports.

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MOVE IN ON *More Profits* with a mobile LORAIN TL-20 MOTO-CRANE

● If you would "hold that profit line in '49" on construction jobs, team up with a Lorain TL-20 Moto-Crane — *today!*

For here's a bundle of brute energy that stays put only when there's work to be done. Traveling on its rugged rubber-tire mounting the TL-20 Moto-Crane "sprints" from job to job at highway speeds up to 30 M.P.H. And with interchangeable boom equipment, this "quick-change artist" can perform equally well as a shovel, crane, clam-shell, dragline or hoe.

Actually, in the TL-20 Series there are a total of 50 possible combinations available, from which you can select the exact machine—in boom and mounting equipment—to match your job conditions and insure greater production and consistent profits. Contact your Thew-Lorain distributor for money-making details on this extremely usable unit.

THE THEW SHOVEL COMPANY • Lorain, Ohio

THEW-LORAIN 1899 50th 1949 ANNIVERSARY

TL-20 FEATURES

Unit Assembly—Easier Service
Interchangeable Parts
5 Identical Clutches
Anti-Friction Bearings
Oil-Enclosed Cut Gears
Lights (Standard)
Starter and Generator (Standard)
Independent Rope Crowd Shovel
Choice of 9 rubber-tire mountings or 2-speed chain drive crawler
Complete interchangeability of 5 booms

Lorain®

Thew Lorain TL 20

. . from rough subgrade to finished pa

Blaw-Knox

Here's a complete concrete paving outfit that will give you better pavement with the fewest men, at lowest cost, in the shortest time — starting with the Blaw-Knox Self-Aligning Road Forms, then the new Blaw-Knox Precision Subgrader, Aggregate Batching and Bulk Cement Plants, the MultiFoote Paver and following through with the combination of Blaw-Knox Concrete Paving Spreader and Finishing Machine. Your pavement will be off to a flying start when you use a Blaw-Knox Precision Subgrader to insure accurate control of slab thickness — low cost for the most expensive type of excavation — uniform cross-section for the subgrade — and plenty of finished grade for any high speed paving operation. For all your concrete construction work — standardize on Blaw-Knox equipment. One manufacturer and one responsibility for quality, performance and low cost.

BLAW-KNOX

BLAW-KNOX DIVISION OF Blaw-Knox Company,
Farmers Bank Building,

The Foote Co., Inc.,
Subsidiary of Blaw-Knox Co.,

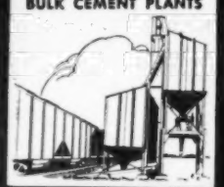
d pavement

all the way!

PAVING FORMS

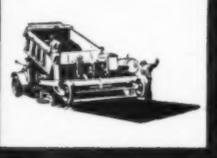
STEEL STREET FORMS

BULK CEMENT PLANTS



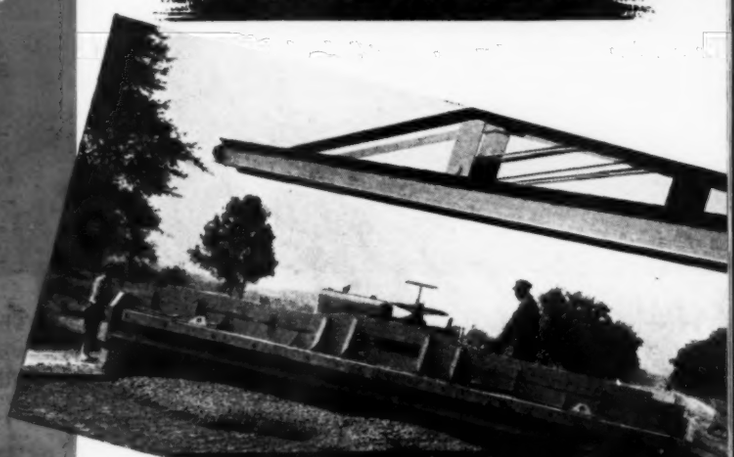
AGGREGATE BATCHING PLANTS

ADNUN BLACK TOP PAVERS

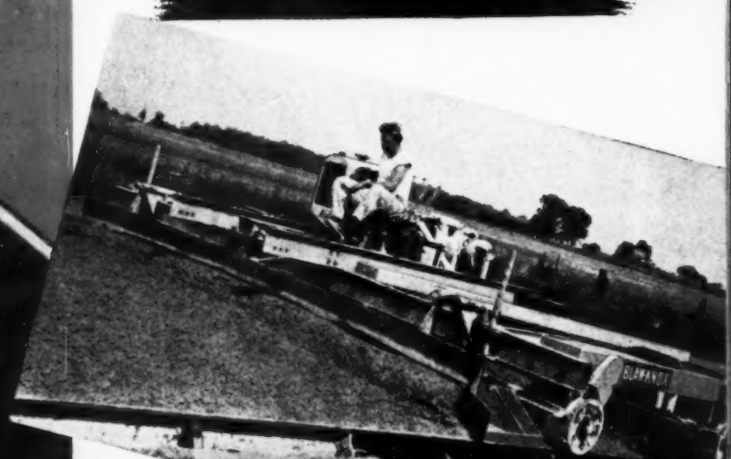


CLAMSHELL BUCKETS

A MULTIFOOTE 34-E DUOMIX PAVING MIXER with its fast charge and discharge gets the concrete on the subgrade in a hurry. The Elevating Boom makes the MultiFoote an all-round high-speed construction tool that will eliminate extra equipment and high costs in the pouring of forms.



A BLAW-KNOX CONCRETE PAVING SPREADER can automatically spread the harsh, dry mixes of two 34-E dual drum pavers no matter where the concrete is placed on the subgrade between forms.



A BLAW-KNOX FINISHING MACHINE following a Blaw-Knox Spreader will give you record smashing production and highest quality of finish of concrete pavement regardless of the type of concrete mix specified or required.

New York • Chicago • Philadelphia
Birmingham • Washington
Representatives in Principal Cities
EXPORT DEPARTMENT
342 Madison Ave., New York, N. Y.

Built to

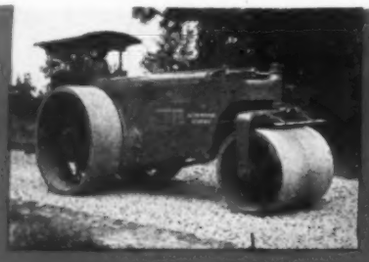
No motor grader without All-Wheel Drive and All-Wheel Steer can hope to equal the all-round operating efficiency of an Austin-Western "88-H," "99-H" or Master "99."

There are no idling front wheels; all weight is on drive wheels contributing 100% traction. All-Wheel Steer provides unequalled maneuverability; saves time on every job.

BADGER CONVERTIBLE SHOVEL. ¾-swing design eliminates tail swing; makes it possible to use the Badger in close quarters; reduces swinging weight and definitely increases work output. The Badger can be converted into a Crane, Dragline, Pile Driver, Trench Hoe, or Skimmer. Wheel mounts provide fast, easy job-to-job portability. A cab is available on special order.

MODEL "40" MOTOR SWEEPER. Fast, maneuverable, and economical in operation. No troublesome expensive conveyor or elevator to keep in adjustment and repair—dirt is thrown directly into the 2-yard hopper. Can be equipped with either right-hand or left-hand gutter broom or both. Leaf Broom attachment simplifies the collection of heavy accumulations of leaves.

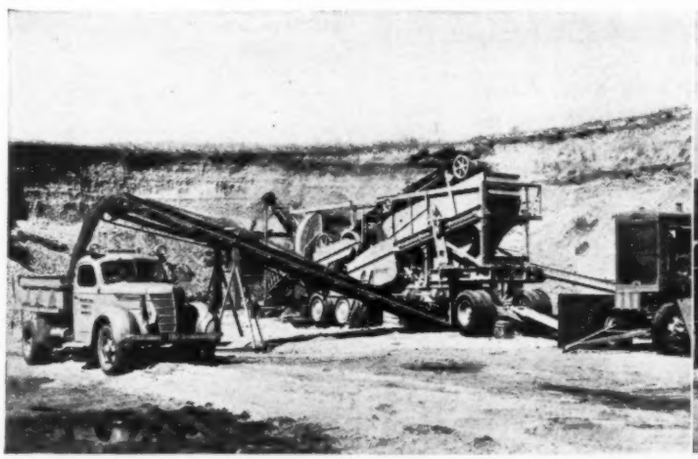
3-WHEELED ROLLERS. Made in sizes ranging from 6 to 12 tons. All have full length side plates for maximum rigidity; low center of gravity for smooth operation, and hydraulic power steer. All may be had with gas or diesel engine. The Roll-A-Plane attachment produces maximum density and surface smoothness.



TANDEM ROLLERS. Variable weight type—in 5-8 ton and 8-10½ ton sizes. Important improvements provide exceptionally smooth and steady performance on precision jobs. Better visibility . . . Less side over-hang . . . More ground clearance . . . Lower center of gravity . . . Steering by effortless hydraulic control.

OUTPERFORM

All-Wheel Drive and All-Wheel Steer make it easy for an Austin-Western Power Grader to do a superlative job of bank sloping. The operator can do all normal ditching and grading; then high-lift the blade to any desired bank cutting position—including the vertical—*without leaving the platform.* No other grader can do it.



PORTABLE CRUSHING PLANTS. Built in sizes and types to fit every production requirement. Equipped with matching Crushers, Screens and Conveyors, correctly balanced to deliver the maximum amount of crushed and screened aggregate in controlled sizes. From the smallest plant to the magnificent "101" pictured above, every Austin-Western Portable Plant is engineered for low-cost tonnage.

STATIONARY CRUSHING PLANTS. This limestone plant with its two Jaw Crushers and Roll Reduction Crusher is typical of the efficiency of design that characterizes every Austin-Western plant. Two men control the entire operation; one at the Primary Breaker, the other to make the rounds of the matching Crushers, Screens and Conveyors. Each Austin-Western plant is tailor-made for its job.

AUSTIN-WESTERN COMPANY • AURORA, ILLINOIS, U. S. A.

BUILDERS OF ROAD MACHINERY

Austin Western

SINCE 1859

These money-making m

ORLANDO, FLORIDA
Cutting this ditch for a curb line takes power and capacity. The sturdy No. 12 has both to spare.

SANTA FE DAM, CALIF.
Grading a haul road for heavy trucks on top of the dam, the No. 12 leaves a smooth surface in rocky material.

BALTIMORE, MARYLAND
Setting the pace for the paver, the No. 12 moves right along finishing final grade on the Philadelphia road.

RAMSEY COUNTY, MINN.
Keeping good roads good — another chore for the No. 12, windrowing on oil mix for stabilizer base.

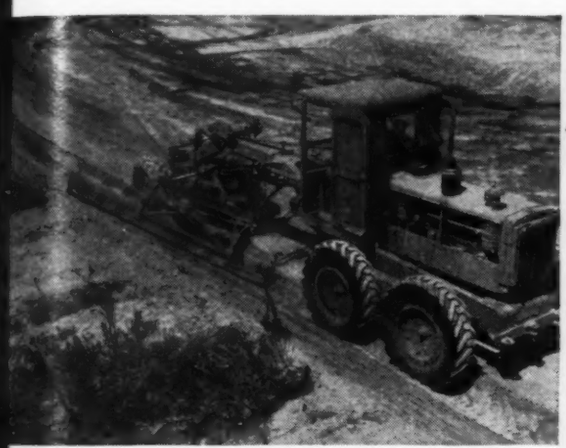
BERTHOUD PASS, COLO.
8000 feet up! This new road requires fine, accurate finishing. The No. 12 "can do" within ¼ inch.

motor graders

sure get around!

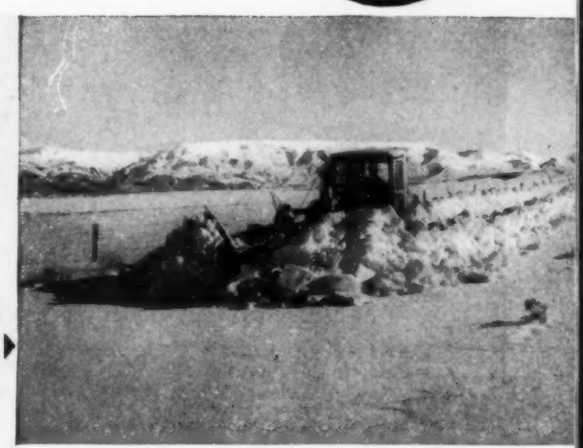
ALL YEAR AROUND, on hundreds of construction and highway jobs, you'll see these husky one-man "Caterpillar" Diesel Motor Graders tackling a wide range of tasks. In scorching heat and bitter cold, they have the rugged stamina for heavy grading, as well as the accuracy for fine finishing. Designed and built entirely by one manufacturer, they're all "Caterpillar"—front axle to radiator cap. And they're sold and serviced by one reliable, well-equipped dealer. The advantage is all yours with these hard-working money makers in your line-up.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS



GRAND COULEE DAM, WASHINGTON

Relocating a highway calls for banksloping, ditching, grading. That's duck soup for the No. 12.



IDAHO FALLS, IDAHO

150 miles of Bonneville County road to keep clear. Equipped with V-type snow plow and wing, the No. 12 does the job.

CENTRAL VALLEY, TRACY, CALIF.

The versatile No. 12, besides maintaining haul roads, is also used for smoothing canal bed ahead of a Monighan.

WASHINGTON COUNTY, COLORADO

A No. 12 widens and rebuilds as much as one mile of road a day.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL

ENGINES • TRACTORS • MOTOR GRADERS

EARTHMOVING EQUIPMENT

MORE BATCHES PER

...even quality mix every

CHECK THESE KWIK-MIX *Bituminous* MIXER ADVANTAGES:

✓**EASY TO LOAD** by hand, from truck or hopper. Smooth, flow-line skip is power-raised . . . can run on extension track for elevated mixer operation. Skip easily removed to charge drum direct from hoppers.

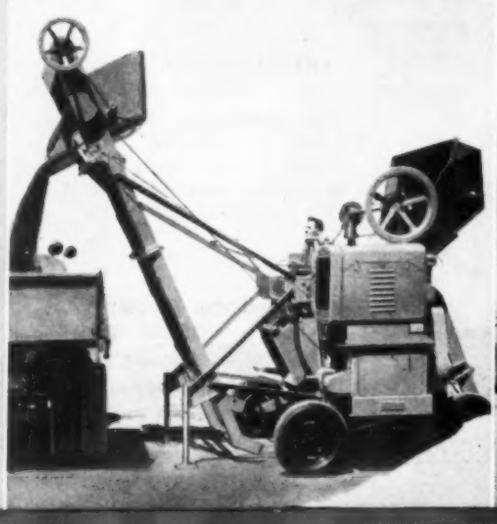
✓**NON-TILTING DRUM** is a rigid, integral part of the frame . . . no tilting stresses or strains . . . gives long, trouble-free service.

✓**FAST, THOROUGH MIX . . .** pugmill type mixer has blades specially designed for bituminous materials . . . push and thoroughly work aggregate and oil from end to center . . . completely coat each particle.

✓**ACCURATE MIXING CONTROL** . . . 1½" asphalt pump maintains continuous oil circulation to and from

▲STATIONARY PLANT . . .

Kwik-Mix bituminous mixers are easily adapted to stationary overhead operation. Above is the 10 cu. ft. model, mounted on skids. One man handles the complete operation . . . controls mixed batch discharge directly into truck.



. . . SETS UP ANYWHERE ▶

For discharging above ground level, special tower attachment is available. Skip is power-operated . . . discharge at top is completely automatic. Collapse tower for road clearance.

KOEHRING PRODUCT

KWIK-MIX *Bituminous*

KWIK-MIX COMPANY • Port Washington, Wisconsin

HOUR *batch*

supply tank . . . generating-type burners provide close temperature control of mixing drum . . . non-splash measuring tank assures uniform oil distribution for even-texture mix every batch.

✓ **6-SECOND DISCHARGE . . .** wide discharge door and sweeping blade action discharge complete batch in about 2 revolutions of paddle shaft . . . step up batches per hour . . . boost daily production.

✓ **FREE-FLOWING POWER . . .** anti-friction bearings, continuous lubrication of reduction gears in oil-tight casings, provide free flow of power with minimum friction loss . . . let you operate skip, oil pump and discharge all at same time.

✓ **2 HEAVY-DUTY SIZES . . .** 14 cu. ft., and 10 cu. ft. . . . stationary or portable models available . . . fit all your requirements for paving, maintenance or patch work.

◀ **PORTABLE . . .**

Mounted on pneumatic tires, Kwik-Mix bituminous mixers are easily moved. Quick end discharge for direct pouring saves time on patch work. Stub axles allow more space for dumping into wheelbarrows. (10 cu. ft. model illustrated in photograph.)

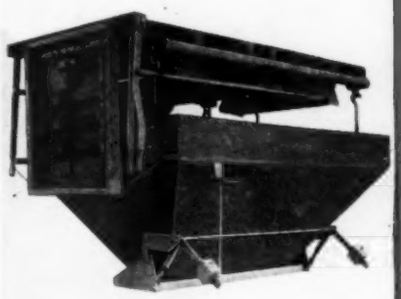
BITUMINOUS MIXER CATALOG AVAILABLE . . .

Write for new, fully illustrated catalog on the versatile No. 14 and No. 10 bituminous mixer . . . or ask your Kwik-Mix distributor to show you what these mixers can do on your jobs.

MIXERS
Koehring Subsidiary

ACCURATE . . . "HI-SPEED" ROADBUILDERS' Batcher

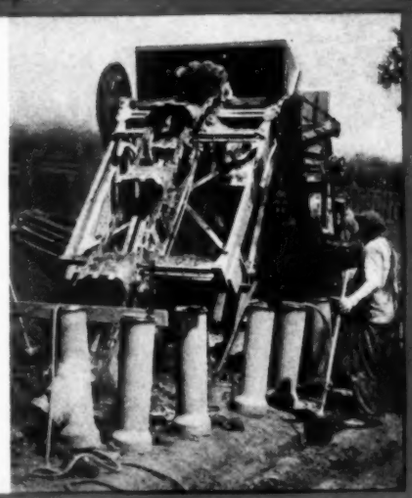
Johnson Roadbuilders' Batchers are completely portable . . . adaptable to fit similar bins . . . provide accurate control . . . produce top-quality concrete with utmost economy of materials. Handle 2, 3 or 4 aggregates in sizes for 34-E paver batch or 2, 3 or 4 yd. batch for charging transit mix trucks. Other Johnson sizes, types to fit production problems of any plant.



C. S. JOHNSON COMPANY
Koehring Subsidiary
Champaign, Ill.

310 TRENCHLINER* digs 15' deep, up to 54" wide

For your heaviest sewer, gas and water-main excavation, check this heavy-duty Parsons 310 Trenchliner. Digs to 15' deep . . . 54" wide . . . has 45 digging speeds from 8" to 186" per minute. Boom is telescopic, easily adjusted for digging depths . . . shifts to cut within 15" of either side of machine. Power shifts the arc-type spoil conveyor. 4 smaller Trenchliners also available.



PARSONS COMPANY
Koehring Subsidiary
Newton, Iowa

MUD-JACK* cuts sub-grade stabilization costs

Where pavements, foundations, sidewalks, curbs or gutters are beginning to settle, Koehring Mud-Jack is a low-cost, easy answer to your problems. Pumps inexpensive soil-cement slurry beneath slab . . . raises structures to original level . . . leaves firm, lasting support. Model 10 illustrated. Ask too, about big Model 50 Mud-Jack for extensive highway use.

*Trademark Reg. U.S. Pat. Off.

KOEHRING COMPANY
Milwaukee 10, Wis.

Now! IT'S THE

BD-3

A 4th DIESEL MOTOR GRADER JOINS THE ALLIS-CHALMERS LINE*

MOST POWERFUL MOTOR GRADER IN ITS CLASS
78 BRAKE HP. — 19,042 LBS.
2-Cycle GM Diesel Engine

A CONSTRUCTION MACHINE THROUGH AND THROUGH

Handles every type of grading on road or street construction—builds ditches, cuts backslopes, removes sod, shapes up and finishes surface . . . scarifies, mixes blacktop, plows snow.

FAST, HIGHLY MANEUVERABLE

- Six Forward Speeds — 2.21 to 15.58 m.p
  . . . Three Reverse — 2.64 to 5.74 m.p.h.
- Travel speeds smoothly synchronized w
  operator controls . . . all the needed pow
  applied as required.
- Easier to steer and maneuver on every ty
  of job — shorter turning radius makes
  ideal for narrow roads and streets.

***OTHER ALLIS-CHALMERS DIESEL-POWERED MOTOR GRADERS**

AD-4, 104 Brake hp. . . . 22,140 lbs. AD-3, 78 Brake hp. . . . . 21,835 lbs.
BD-2, 50.5 Brake hp. . . . 17,772 lbs.

COMPLETELY EQUIPPED including electric starter and lights. Available with scarifier, cab and snowplow. Choice of 7:50, 9:00 or 13:00 front tires.

PATTERNED AFTER THE POPULAR MODEL AD MOTOR GRADER

STRONG — exclusive tubular frame . . . absorbs shocks, protects control rods inside frame.

ACCURATE — cuts smoothly, blade held firmly on road through direct down pressure.

HIGH CLEARANCE — 28" throat clearance for handling bigger windrows without interference.

"ROLL-AWAY" MOLDBOARD — less power required to handle bigger windrows at faster speeds. Material is rolled, not pushed.

FULL CIRCLE REVOLVING BLADE — swings 360° . . . enables operator to grade either forward or reverse.

FULL RANGE OF BLADE POSITIONS . . . plus leaning front wheels, for handling all types of grading with ease.

ALLIS-CHALMERS

TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

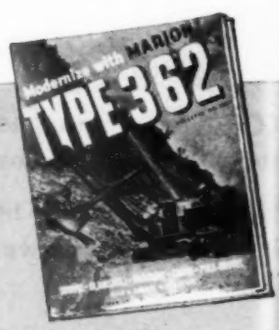
GET TOP YARDAGE FOR YOUR MONEY

You will with a . . .

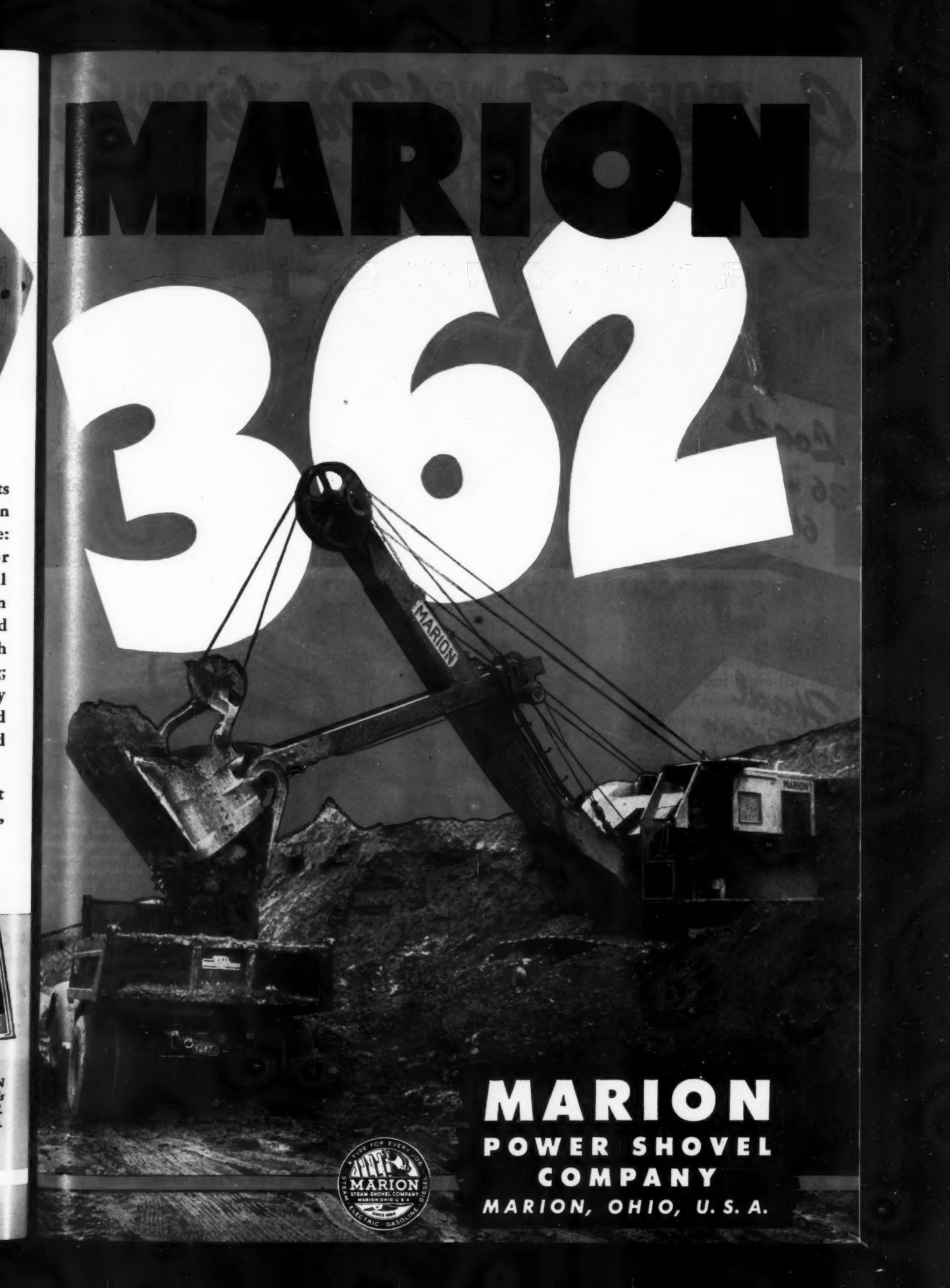
QUICKLY CONVERTED ON THE JOB!

● The MARION 362 is a BIG PRODUCTION machine that eats up the yards in "nothing flat" on today's fast moving construction projects. Here are the MARION features that make this possible: up-to-the-minute design; sturdy fabricated construction; engine or electric motor with ample reserve power; air control for all motions that responds with a flick of the finger; independent chain crowd; adjustable hook rollers reduce load on center journal and increase length of digging lever arm; extra long crawlers with wide pads that are self-cleaning, non-clogging and self-binding; spots load accurately; accessible main machinery which is quickly and easily convertible from shovel to dragline, cranes, etc.; and many others. Live boom hoist unit available which may be added to any machine combination.

For a fast . . . accurate . . . mobile . . . economical machine that will stand up to the toughest digging and operating schedules, put this 1-1/2 yard MARION on your job.



WRITE FOR BULLETIN No. 389-A. It describes this fast, husky digger in detail. It is yours for the asking.


MARION
362
MARION
MARION
MARION
POWER SHOVEL
COMPANY
MARION, OHIO, U. S. A.

Contractor Frank Braden says

Loads
36 seconds
60'-85'

Haul
and Return
132 seconds
1400'

LeTourneau electric controls give instant action easier and help save cable costs. As contractor Braden states it, "Electric power where it's needed, gives me substantial savings as cable lengths are shorter and last longer."

Spreads
24 seconds
80'-90'

Total Cycle 3.2 min.

R. G. LeTOURNEAU, Inc., Peoria, Ill.

NAME..... TITLE.....

COMPANY.....

ADDRESS.....

CITY, STATE.....

Please send:

- ☐ Additional C Tournapull job reports
- ☐ Bulletin on C Tournapull
- ☐ Information on Tournadozer
- ☐ Distributor representative to

"Superior to crawler-scraper combinations on any length haul"

ON a 1,229,000-yard Iowa State job on Route 92 west of Bridgewater, Frank Braden Construction Co. of Hastings, Nebraska, has proved their 5 new C Tournapulls beat crawlers on **every type** of operation.

"For short-haul work, cutting and finishing slopes, especially tail slopes at the end of a cut, these Tournapulls are superior to tractor-scraper combinations", was the way Frank Braden put it. "We used Tournapulls to cut all our foreslopes and backslopes and they ran from 2 to 1 up to 4 to 1. Even on slopes cut with tractor-scrapers, our Tournapulls were used to finish slopes as they did a better job, and did it much faster."

"C's" haul 700' at rate of 160 pay yards per hour

On straight production earthmoving here are figures that speak for themselves. Over a 700-foot one-way haul, loading wet, slippery clay, Braden's C Tournapulls averaged 8 loads each every 30 minutes. Average pay load was 10 cubic yards. This fast 3.2-minute cycle was maintained over soft, rutted haul-roads, with grades up to 9%. Figures were confirmed by the contractor as typical of the job.

Tournapulls pull through mud that stalls crawlers

In regard to the "C's" job-hauling ability, Superintendent Joe Easter says: "These new Tournapulls will go anywhere a tractor-scraper combination can go and some places where a crawler can't go. Several times we have had our big crawlers stuck in the mud, have pulled them out and used C11's to finish the job. Crawler grousers pack with clay, robbing them of all traction . . . big Tournapull tires continually flex to keep treads fairly clean. The Tournapulls pull right through the mud and keep going."

Austin V. Beal, Tournapull operator, adds: "These machines are much easier to operate and less tiring. I have operated in mud and taken out loads where a crawler and scoop couldn't go."

Tournadozers speed loading

Fast-stepping Tournadozers were push loading the C Tournapulls in 60 to 85' in average loading time of 0.6 minutes. Clay was heaped and packed in against the dirt-guard for maximum capacity loads. Some loads were completed in as little as a half minute or less.

Performance earns repeat order

Braden started the '48 season with 3 of the new electric-control C Tournapulls and one C Tournadozer on a 180,000-yard farm-to-market road in Montgomery County. After one month's experience with this high-speed, high-production equipment, he bought two more C Tournapulls and another C Tournadozer. Within 4 hours after finishing in Montgomery County, Braden's Tournapull and Tournadozer fleet was moving dirt on Route 92, 40 miles away! The machines were originally driven in 70 miles from Omaha in 6¼ hours.

We have many other similar job reports on the new Tournapulls and Tournadozers. Send for them and see for yourself how much more production you'll get with these new high-speed rigs. Your LeTourneau Distributor will be glad to go over them with you and show you how much more profitable your '49 work can be. Don't delay . . . investigate now.

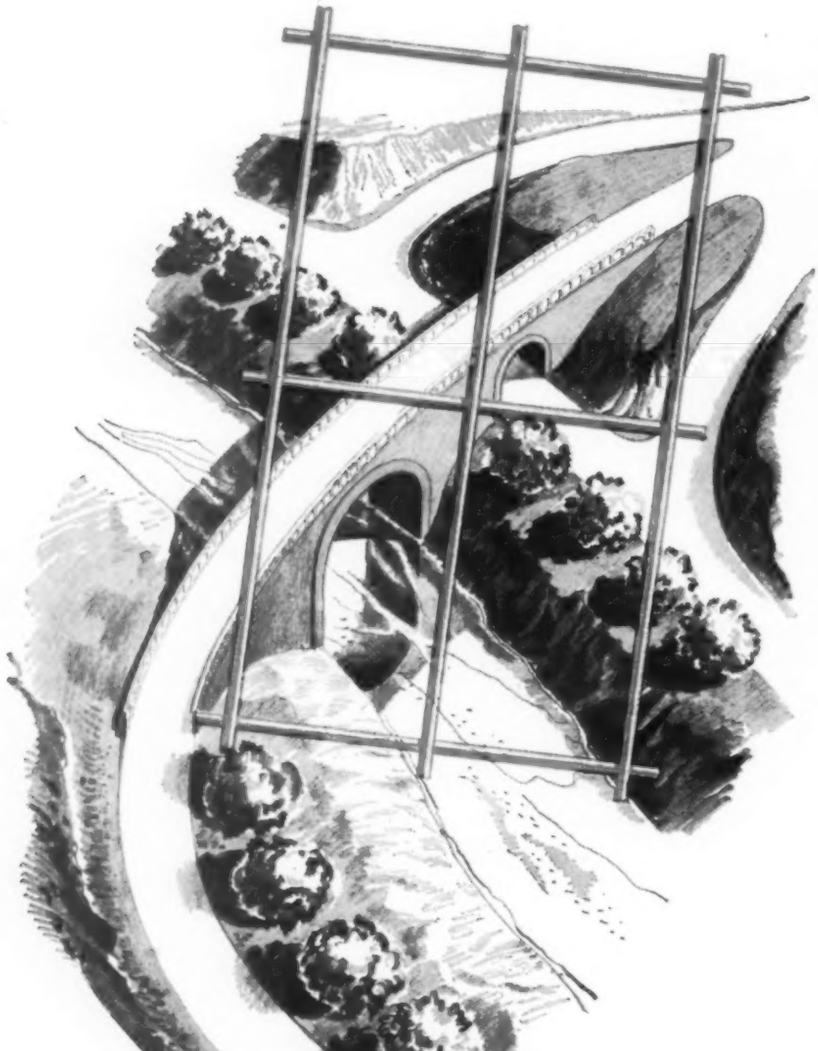
Tournapull—Trademark Reg. U.S. Pat. Off. Tournadozer—Trademark C112

LETOURNEAU PEORIA ILLINOIS — HIGH-SPEED RUBBER-TIRED — TOURNAPULLS

MORE YARDS PER HOUR WITH RUBBER-TIRED POWER

For years of low cost service...

buy American Welded Wire Fabric



● You build longer life at lower cost into concrete roads when you use American Welded Wire Fabric Reinforcement.

High yield point steel wires strengthen the slab. Cracking is reduced; cracks that may form are kept bound together by closely spaced cold drawn steel wires and further damages to slab and subgrade are prevented. That means longer pavement life and money saved on yearly maintenance.

U·S·S American Welded Wire Fabric is the world's most widely used prefabricated reinforcement for concrete. Its unexcelled performance in thousands of miles of modern highways is your assurance of satisfaction.

American Steel & Wire Company
Cleveland, Chicago and New York

Columbia Steel Company, San Francisco
Pacific Coast Distributors

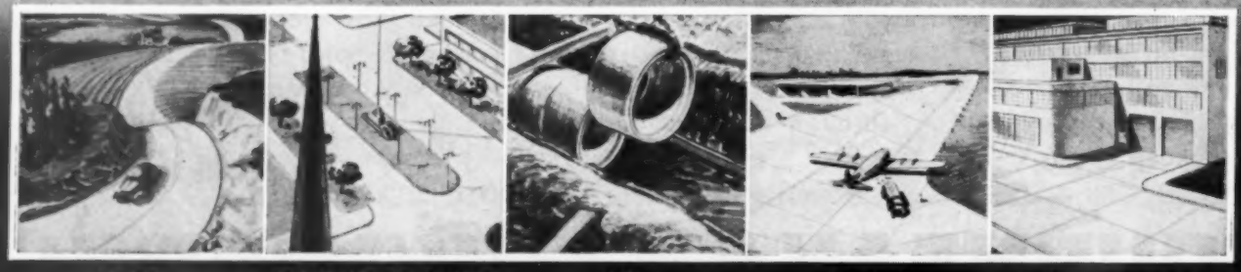
Tennessee Coal, Iron & Railroad Company, Birmingham
Southern Distributors

United States Steel Export Company, New York

UNITED STATES STEEL

AMERICAN STEEL & WIRE COMPANY
USS
AMERICAN WELDED WIRE FABRIC
UNITED STATES STEEL

Every reinforced concrete paving job will be a better job when you use AMERICAN WELDED WIRE FABRIC.



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NOW YOU CAN *Do Something about the Weather!*

Get all-'round, all-weather, pavement protection with FLINTSEAL. . . the modern thermoplastic rubber-asphalt joint-sealing compound*

Mark Twain said, "Everybody complains about the weather, but nobody *does* anything about it."

Well, *you* can . . . at least insofar as weather's wear and tear on pavement is concerned! How? Specify *Flintseal* for joint-sealing compound on highways, streets, airports . . . or any other job where jointed concrete slab is laid.

This modern, thermoplastic, rubber asphalt compound is especially designed for this job. It adheres tenaciously to joint walls. It retains its superior characteristics of bond and flexibility under the most extreme temperatures . . . through complete cycles of expansion and contraction of the slab. And Flintseal's long, trouble-free service life means low joint-maintenance cost.

Properly applied, Flintseal gives you positive protection. Can you say as much for the joint-sealing compound you're using now? Be sure you get full details on this modern, hot-poured joint-sealer before you start another job.

Write, today, to:

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Industrial Products Division
30 Rockefeller Plaza, New York 20, N. Y.
ATLANTA • BOSTON • CHICAGO HEIGHTS • DETROIT
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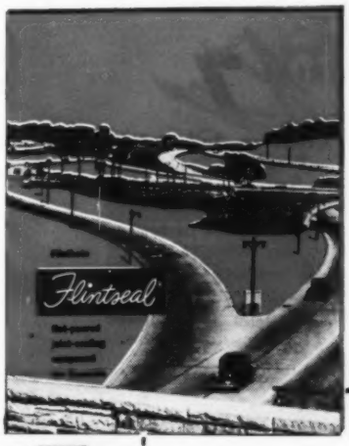
Flintseal*

HOT-POURED JOINT-SEALING COMPOUND

*T. M. Reg. U. S. Pat. Off.

AND FOR THE SMALLER JOBS →

. . . use this recently developed portable kettle. Ideally suited for sealing industrial floors, steps, stadia, swimming pools, driveways, walks, roofs and the like. Ten gallon tank unit melts six to seven gallons of Flintseal per hour. Overall dimensions: diameter 19 inches, height 34 inches.



← SEND FOR NEW FLINTSEAL FOLDER . . . YOURS FOR THE ASKING

Get full details on Flintseal, together with complete descriptions and illustrations of the special equipment for the heating and application of this efficient joint-sealing compound. Learn how easy it is to get more trouble-free mileage on highways, streets and airports.

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Industrial Products Division
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New York 20, N. Y.

Gentlemen: Please send me your *FREE Folder on Flintseal.*

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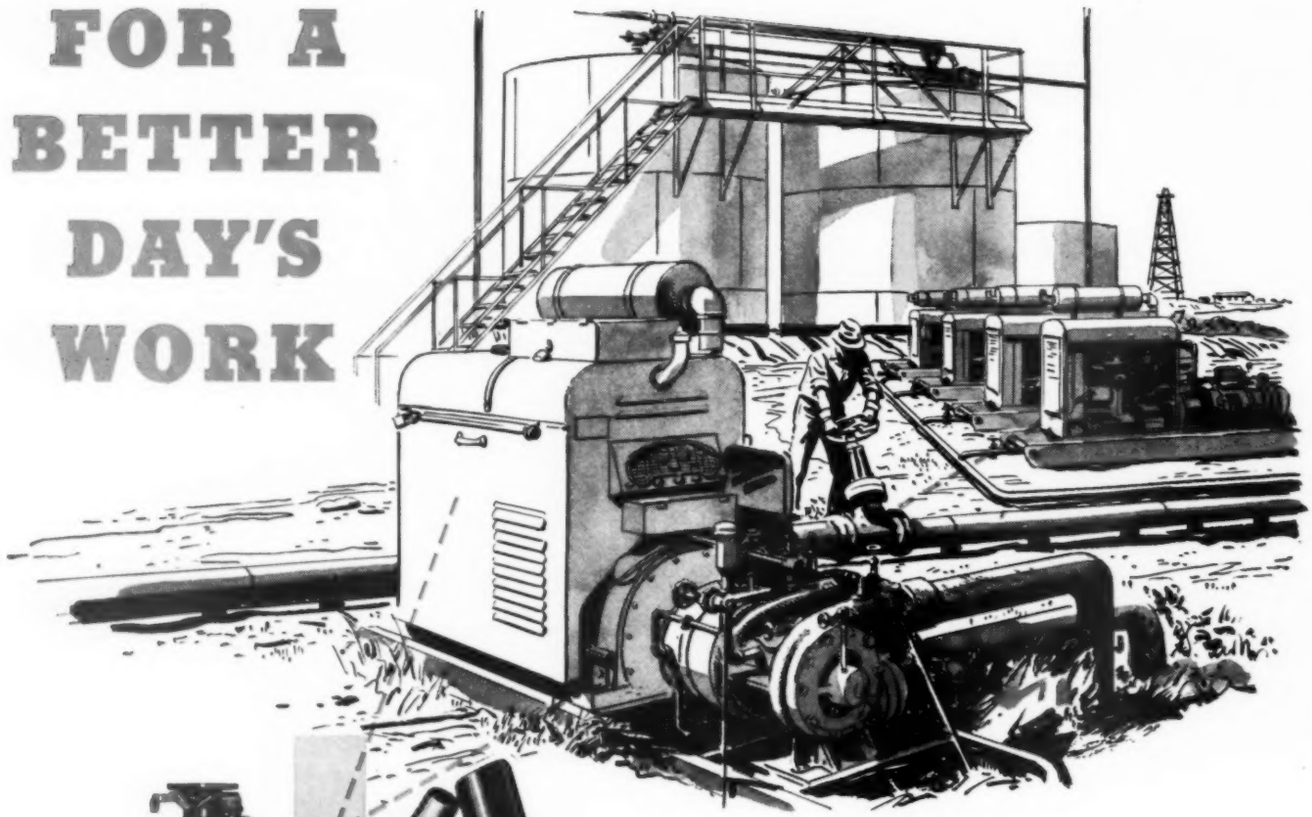
RS-249

FOR A BETTER DAY'S WORK



in oil fields—

IN INDUSTRY—ON FARMS—IN FORESTS AND ON THE HIGHWAYS!

Pumping "black gold" from the earth . . . rushing oil along vital pipe lines into storage tanks . . . or providing field power for a hundred other jobs—those are just a few of the many assignments given to Chrysler Industrial Engines or Power Units. For dependable, economical, Chrysler-built power in any industrial or agricultural application, see your Chrysler Industrial Engine dealer,—or write for information to . . .

INDUSTRIAL ENGINE DIVISION, CHRYSLER CORP.
12200 E. JEFFERSON, DETROIT 31, MICHIGAN

MODEL INDUSTRIAL 7
SIX CYLINDER

One of the seven basic Chrysler Industrial Engine models. Bore 3¾". Stroke 5". 331.4 cubic inches Displacement. Engine assembly equipped with truck type clutch housing, 20" suction type fan, hot type oil bath carburetor air cleaner, carburetor with built-in velocity type governor, oil filter with removable type cartridge, and 6-volt electrical equipment. Generally used in powering snow shovels, industrial mobile units, sawmills and air compressors.

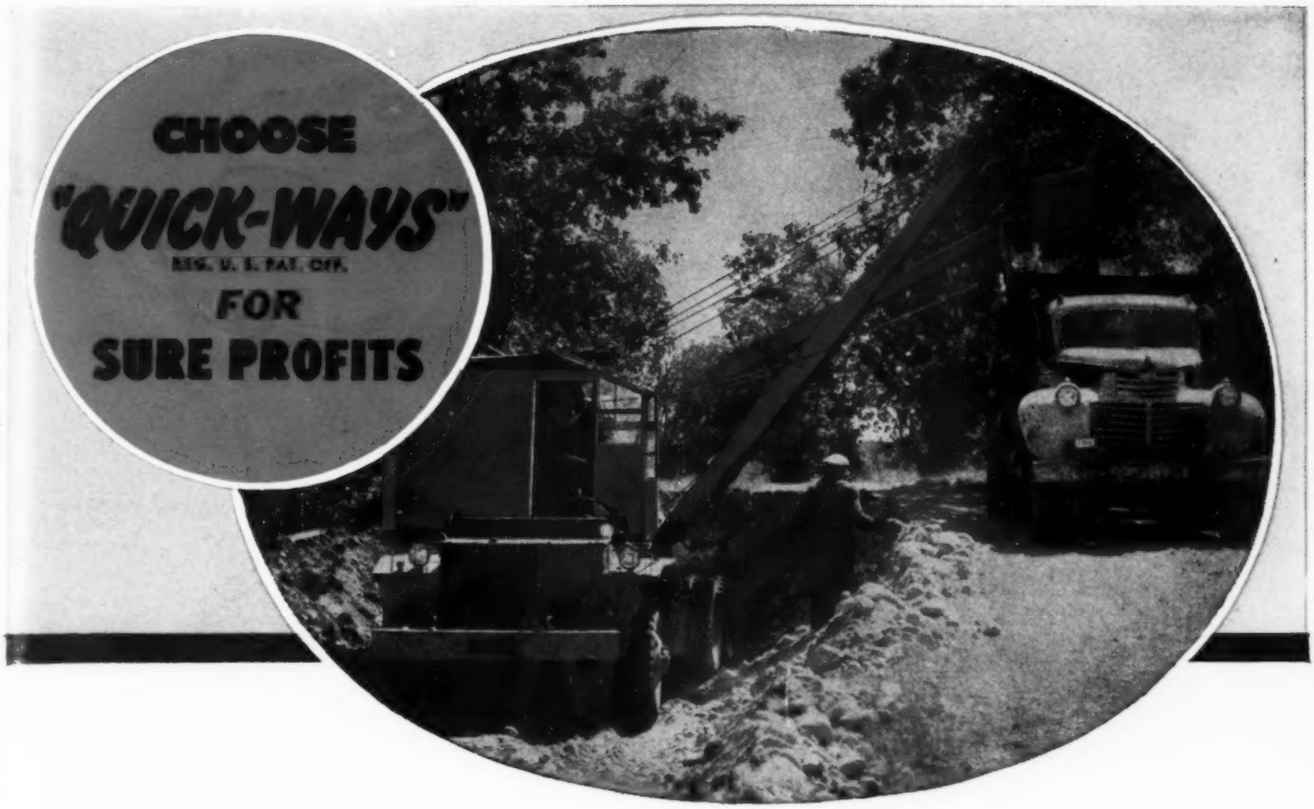
NATION-WIDE SERVICE

FACTORY-ENGINEERED AND TESTED PARTS WITH EXPERT MAINTENANCE WHEREVER YOU ARE

CHRYSLER

INDUSTRIAL ENGINES AND POWER UNITS

HORSEPOWER WITH A PEDIGREE



PORTABILITY AND CAPACITY . . . these are the fundamentals you KNOW you want in a truck shovel. You get PORTABILITY in a *"QUICK-WAY"* because it is built of steel for lightness and strength, no heavy counter-weights to slow you down. You get CAPACITY because balance and stability are designed into your *"QUICK-WAY"*.

In addition you get **SPEED . . . PERFORMANCE . . . VERSATILITY . . . INTERCHANGEABILITY . . . SIMPLICITY . . . ECONOMY OF OPERATION . . . LOW FIRST COST . . . LOW MAINTENANCE . . . and EXTRA PROFITS.**

A *"QUICK-WAY"* mounts on ANY standard truck of proper size to go anywhere a truck can go at truck speed. A *"QUICK-WAY"* is CONVERTIBLE IN MINUTES from SHOVEL to CRANE, DRAGLINE, CLAM-SHELL, PILE DRIVER, SCOOP, TRENCH-HOE or BACK FILLER. You buy only the attachments you want. A *"QUICK-WAY"* is simply built, with many interchangeable parts, all easy to service . . . and durable.

THE FUNDAMENTALS built into every *"QUICK-WAY"* add up to sure profits on a small investment, with one of the most useful machines you can own.

NO MATTER WHAT OTHER EQUIPMENT YOU OWN, you need *"QUICK-WAYS"* too. There's a *"QUICK-WAY"* owner near you; ask HIM.

• Service available from Distributors strategically located throughout U. S. Others worldwide

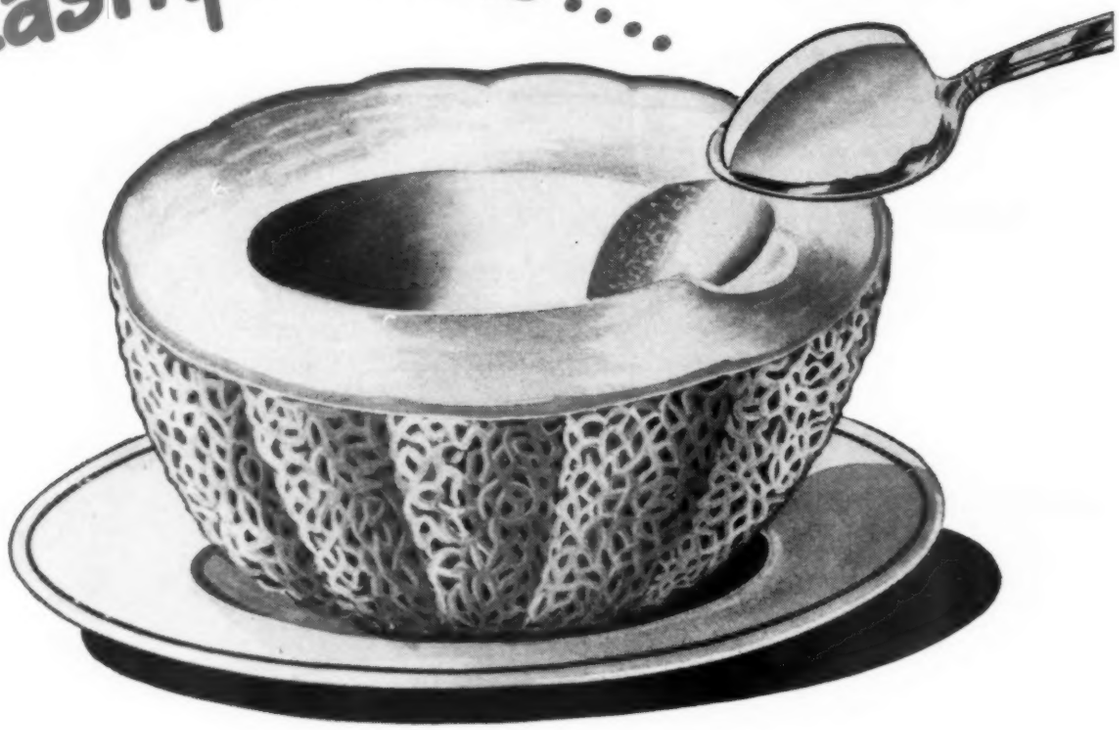
MODEL E: 4/10 cu. yd. cap. for mounting on any standard 5-ton truck.
MODEL J: 1/4 cu. yd. cap. for mounting on any standard 1½-ton truck.

For speed, portability, economy of operation, and adaptability to a wider range of jobs, nothing of comparable size equals a "Quick-Way" Truck Shovel.

"QUICK-WAY" TRUCK SHOVEL CO.

DENVER, COLORADO

As Easily As This....



THE "Ottawa" HYDRAULICALLY CONTROLLED BUCKET

The Ottawa Heavy Duty Industrial loader with mechanical bucket. These quality loaders can now be had with hydraulically controlled bucket. Loaders available for most makes Industrial Tractors.

SCOOPS, LIFTS, UNLOADS

just as easily as you take that first bite from a dead ripe melon. Ottawa Heavy Duty Industrial loaders now offer as optional equipment hydraulically controlled buckets. This scientifically designed bucket gives you greater lifting power and maneuverability with less strain on tractor or loader.

The Ottawa hydraulically controlled bucket gives the tractor operator complete control of each load at every stage of loading, lift or dump. Finger tip control gives safety and economy, saves wear and tear on all equipment, loader, tractor and trucks.

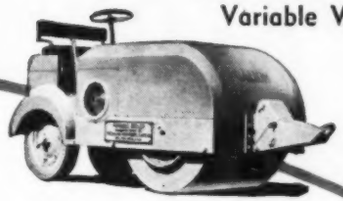
It's new—It's a feature your customer has been looking for—It's low cost—It's economical—Write today for complete details and price list.

The Ottawa INDUSTRIAL HYDRAULIC FRONT END LOADER

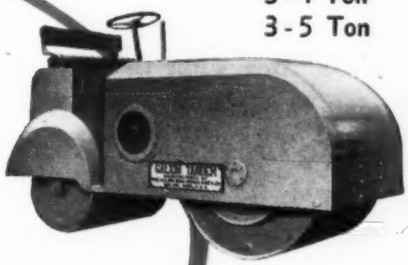
Ottawa STEEL PRODUCTS, Inc.
INDUSTRIAL DIVISION
OTTAWA, KANSAS • U. S. A.

42 YEARS EXPERIENCE

PORTABLE ROLLER
Variable Weight



TANDEM ROLLERS
3-4 Ton
3-5 Ton



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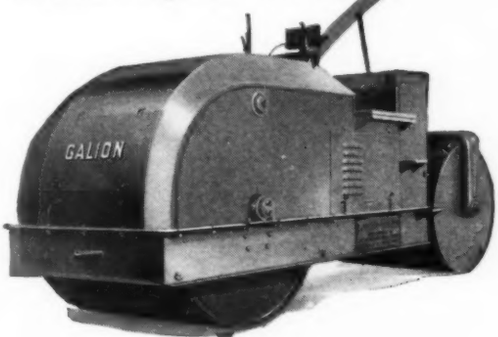
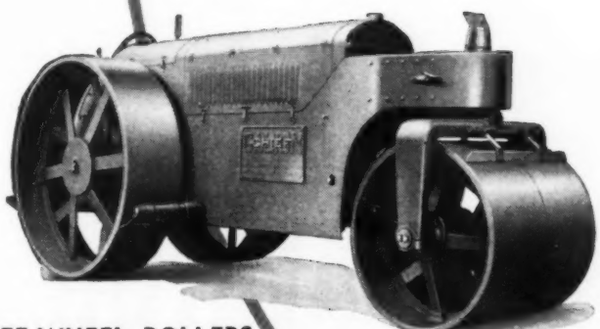
WORLD'S LARGEST MANUFACTURER OF ROLLERS

TANDEM ROLLERS
5, 8, and 10 Ton Sizes
Variable Weight 5 to 14 Tons





THREE-WHEEL ROLLERS
6, 7, 8, 10, and 12 Ton Sizes

THE GALION IRON WORKS & MFG. CO.

General and Export Offices
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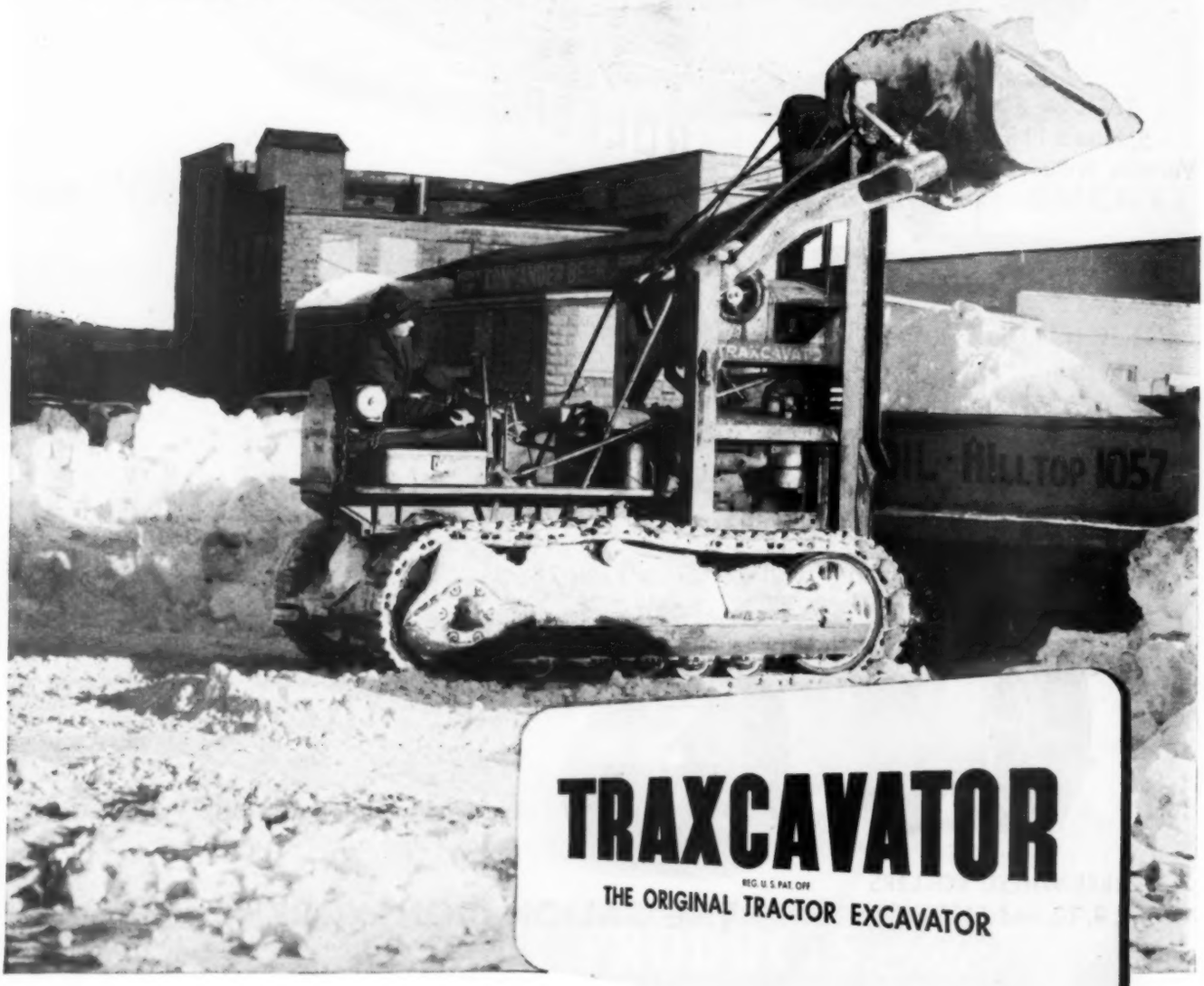
Cable Address: GALIONIRON, Galion, Ohio

TRAXCAVATOR'S WORK IS NEVER DONE!

No matter what the season — there are always jobs for TRAXCAVATORS. In winter, it's snow removal — clearing snow-blocked streets, alleys, parkways and highways. TRAXCAVATORS give you the fast, smooth action you need to dig out hard-packed snow, scoop up heavy slush, carry it any distance and dump it into waiting trucks or disposal piles.

During the rest of the year these machines are constantly at work handling sanitary fills, digging up pavement, repairing streets, stockpiling and doing a multitude of other jobs. Get all the facts on these money-saving machines — see your nearest Trackson-"Caterpillar" dealer or write direct to Trackson Company, RS-29, Milwaukee, Wisconsin.



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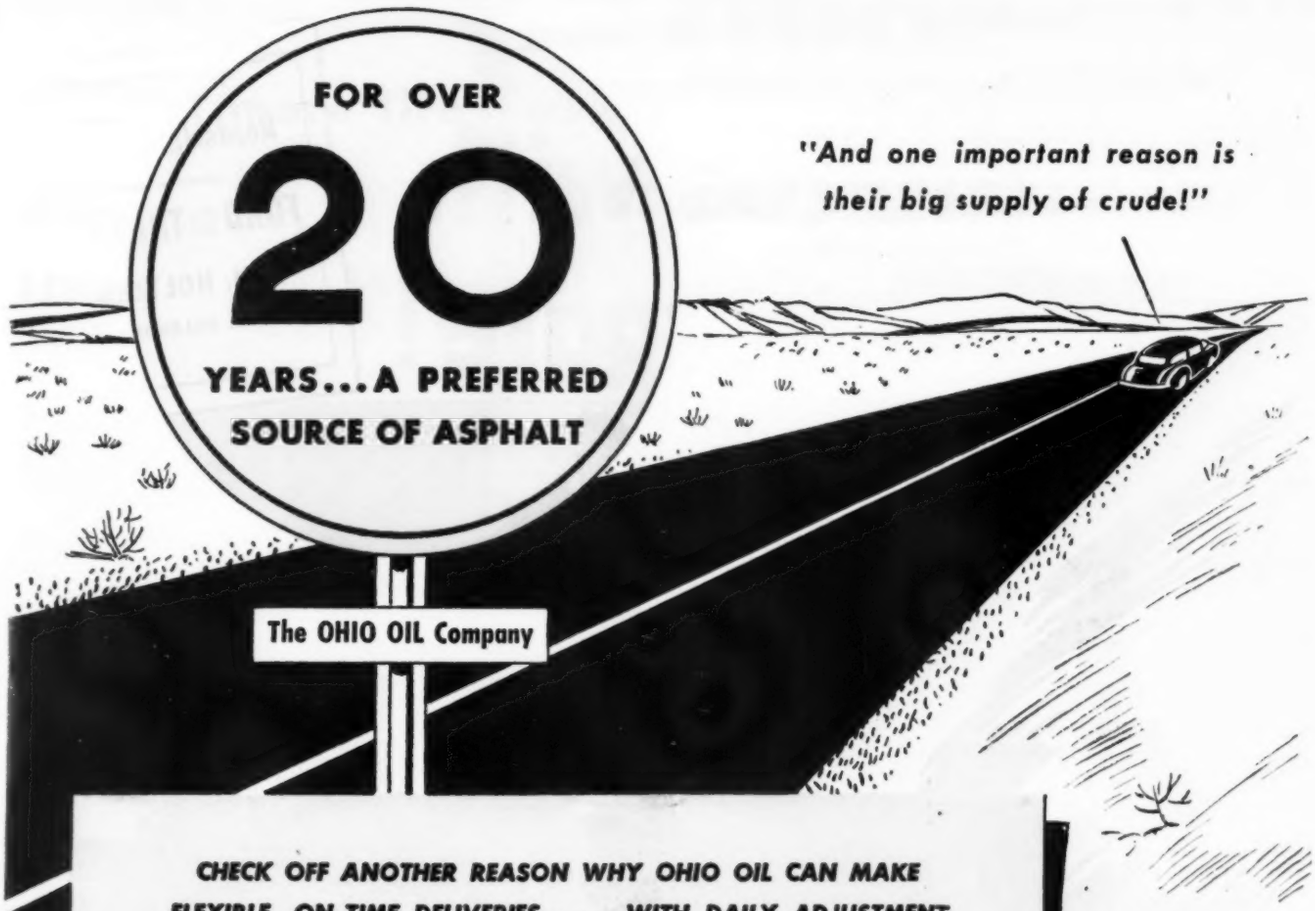
THE ORIGINAL TRACTOR EXCAVATOR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20
YEARS...A PREFERRED SOURCE OF ASPHALT
"And one important reason is their big supply of crude!"
The OHIO OIL Company

CHECK OFF ANOTHER REASON WHY OHIO OIL CAN MAKE FLEXIBLE, ON-TIME DELIVERIES . . . WITH DAILY ADJUSTMENT OF SCHEDULES TO MEET LOCAL JOB CONDITIONS

✓ Ohio Oil, one of the largest producers of crude in the country, owns and produces all of its own crude. That assures first choice of best asphaltic crudes—assures you of all the top quality asphalt you want, when you want it!

AMPLE REFINERY CAPACITY! One of the major producers of asphalts for over 20 years. Greatly increased production in 1949 as result of expansion program.

AMPLE STORAGE FACILITIES for all types and grades of asphalt (increased for '49) to insure immediate shipments and to meet peak demands.

TOP ENGINEERING SERVICE, TOO. You get reliable recommendations, based on exhaustive field and laboratory studies, to make sure you get the right type of asphalt for local aggregate and other conditions.

AMPLE LOADING FACILITIES for tank cars—also increased for '49.

LARGE RESERVE OF TANK CARS in all sizes.

ONE COMPANY CONTROL. All operations under direct refinery control of The Ohio Oil Company.

Ohio Oil serves this 15 state area

Contact nearest office or state representative for all grades of asphalt and asphalt cements

The OHIO OIL Company • *Asphalt Department*

ROBINSON, ILLINOIS • LOVELL, WYOMING • Producers of petroleum since 1887

MARATHON

"Our FORD F-7 does the job with POWER to spare!"

Roadside Report

FORD Bonus Built TRUCKS

E. H. HOLTZEN
ENID, OKLAHOMA

"THIS TIME we graduated into the big truck class with a Bonus Built Ford F-7 Big Job," writes E. H. Holtzen of Enid, Oklahoma. "Our Ford F-7 does the job with power to spare, and we can understand what you mean by 'Bonus Built.' Our costs have been negligible, and our gas mileage is very economical."

With Mr. Holtzen, as with thousands of other extra heavy duty truck users, the new Ford 145-horsepower Big Jobs are all the go! One reason why . . . engine power second to none in its class. Second reason . . . the luxury of the new Ford Million Dollar Cab. Third reason . . . Bonus Built construction, a feature of every one of over 139 Ford Truck models. Bonus Built is the superstrong construction that contributes to long truck life. Life insurance experts prove Ford Trucks last longer!

ONLY THE FORD BIG JOB
HAS ALL THESE FEATURES!

- ★ **New 145-h.p. Ford V-8 engine for top performance.**
- ★ **Ford exclusive concentric dual-throat carburetor for more power, more economy.**
- ★ **New heavy duty 5-speed transmissions for operating flexibility.**
- ★ **Big Ford rear brakes for sure-footed stopping; 16-inch by 5-inch in the F-8.**
- ★ **Ford Super Quadrax 2-speed axle with vacuum shift for performance flexibility in Model F-8 (single speed axle also available); single-speed Quadrax Hypoid Axle in Model F-7.**
- ★ **Large diameter (10-inch) wheel bolt circle with 8 studs to allow for extra-strong hub construction.**
- ★ **Million Dollar Cab with Ford Exclusive Level Action suspension for greater driving comfort.**
- ★ **Nationwide service from over 6,400 Ford Dealers.**
- ★ **Ford Bonus Built construction for long truck life.**

Gross Vehicle Weight Ratings: F-8 up to 21,500 lbs., F-7 up to 19,000 lbs. Gross combination ratings: F-8 up to 39,000 lbs., F-7 up to 35,000 lbs.

FORD 1949 — *Bonus Built* — TRUCKS 1959

BUILT STRONGER TO LAST LONGER

USING LATEST REGISTRATION DATA ON 5,444,000 TRUCKS, LIFE INSURANCE EXPERTS PROVE FORD TRUCKS LAST LONGER!

3 times more life *when hard-faced with*

STOODY SELF-HARDENING 21

On a competitive test, crushing quartzite at high speed, this portable roll crusher operated 3 times longer when protected with Bare STOODY SELF-HARDENING **21** than with a more costly alloy. An additional bonus was obtained in freedom from spalling–even after repeated hard metal applications.

The new STOODY SELF-HARDENING **21** holds many advantages to users of heavy equipment:

Exceptional abrasion resistance • Good impact strength • Heavy deposits in a single pass • Bare rods run as easily as coated with D.C. electric welders • Can also be applied with A.C. • No slag • Multiple passes • Bonds readily to manganese steel, cast iron or common steels

For all-around weldability, STOODY SELF-HARDENING **21** can't be beat–its exceptional burn-off rate, wide amperage latitude and freedom from slag interference save you time, simplify hard-facing requirements. Try 50 lbs. on your next wear-proofing job. Call your Stoody dealer for complete information and literature . . . or write to

STOODY COMPANY 1125 W. SLAUSON AVE., WHITTIER, CALIF.

with OLIVER "Cletrac"!

One of the primary features designed into every Oliver "Cletrac" crawler tractor is safety . . . safe traveling on dangerous hills and slopes.

The exclusive Oliver "Cletrac" steering principle assures positive traction on both tracks *at all times.* For example, when turning, one track is speeded up, the other slowed down. Power is never completely disconnected from either track at any time as is the case with "clutch" type steering. Thus there is always a factor of safety with both tracks engaged, providing power and traction where operations must be carried out regardless of conditions . . . added safety on hills and slopes. It's easier to handle, too, because there is no need to "declutch" when turning.

This exclusive steering principle lets you take full advantage of all tractor power. Since there is always power on both tracks, you can handle bigger loads . . . can balance the side drag of off-center loads . . . get more work done in less time, features that mean greater profit for you.

Investigate the *plus* advantages you get with an Oliver "Cletrac" crawler tractor. Your Oliver "Cletrac" dealer will be glad to give you the story. The OLIVER Corporation, Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio.

Cletrac

a product of

The OLIVER Corporation

A complete line of Crawler and Industrial Wheel Tractors

UNIT'S "Big 3"

Designed for FASTER and EASIER OPERATION . . . where the Going is TOUGH!

UNIT 514
½-Yard Dragline

UNIT 1020
¾-Yard Shovel

ALL *Unit Models* are Convertible to ALL *Attachments*

UNIT 357
5-Ton Mobile Crane with Magnet Attachment.

Here are three time-tested UNIT machines that continue to "make the headlines" because of their unusual speed, efficiency and all-around dependability. Check the following exclusive UNIT features: *Compact, streamlined design . . . Straight line engine mounting . . . Drop forged alloy steel gears . . . Automatic traction brakes . . . Interchangeable disc type clutches . . . One-piece cast gear case* . . . and above all, UNIT's safety-promoting *FULL VISION CAB.* No other excavator on the market has all these features.

You can tell it's a UNIT by the FULL VISION CAB. There's no other cab like it.

UNIT CRANE & SHOVEL CORP.

UNIT CRANE & SHOVEL CORP. UNIT MILWAUKEE WISCONSIN

6407 W. BURNHAM ST.
MILWAUKEE 14,
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PRODUCTIVE INTERNATIONAL POWER *Pays Profits*

Grading 11.8 miles of farm-to-market roads required moving 205,000 yards of earth. Here's a job that demanded dependable, productive earthmoving power. Chosen for the task—six International TD-18 Diesel Crawlers, one International ID-9 Diesel wheel tractor, two International-powered graders and an International-powered self-propelled scraper.

Here's another example of what contractors are discovering every day—it's wise to standardize on International Power. It pays off in lower operating and maintenance costs and in *more work done in a shorter time.*

Discuss your earthmoving problems with your International Industrial Power Distributor. He'll show you how International tractors and International-powered earthmoving equipment will put more profits in your pocket on any earthmoving job.

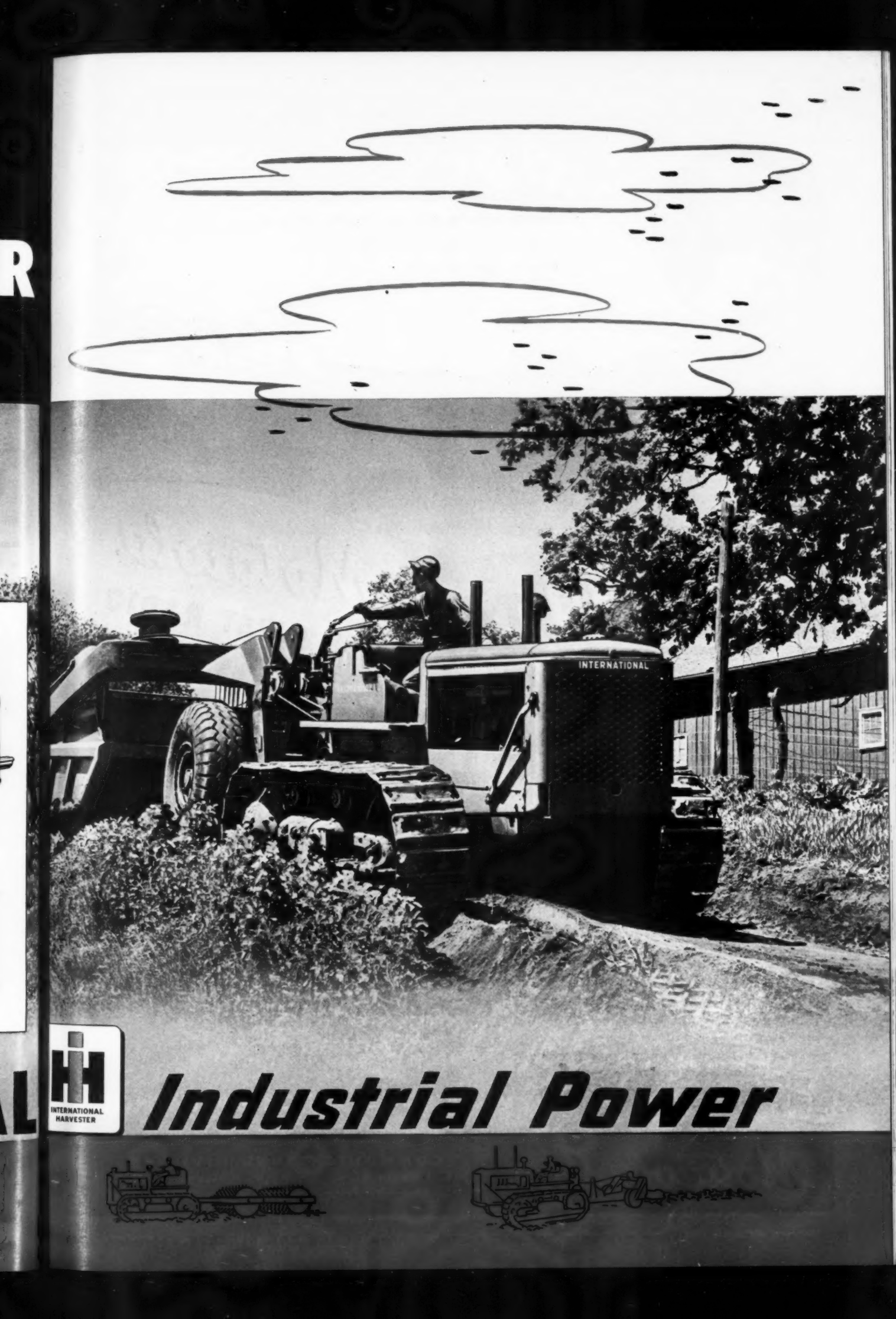
Industrial Power Division
INTERNATIONAL HARVESTER COMPANY
Chicago 1, Illinois

The International UD-18A engine is the power plant in the TD-18 Crawler. This dependable Diesel is one of a line of six Diesel and four carburetor-type International Power Units. Whatever your power and equipment needs may be, specify International engines for all your requirements. Productive International Power is the key to greater profits.

Tune in James Melton on "Harvest of Stars" CBS Wednesday evenings

CRAWLER TRACTORS
POWER UNITS
DIESEL ENGINES
WHEEL TRACTORS

INTERNATIONAL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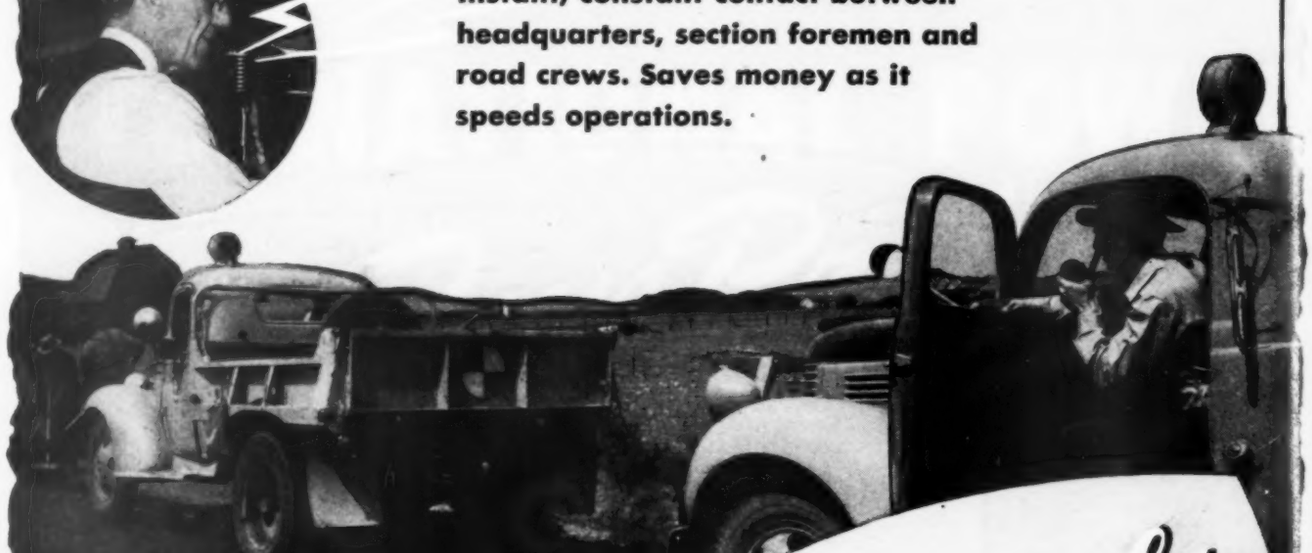

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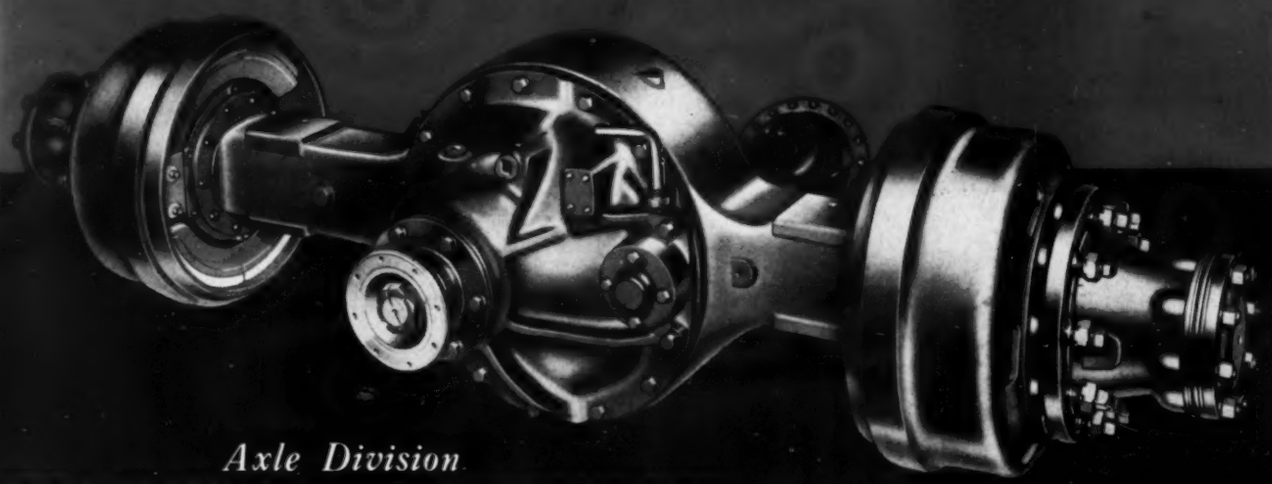

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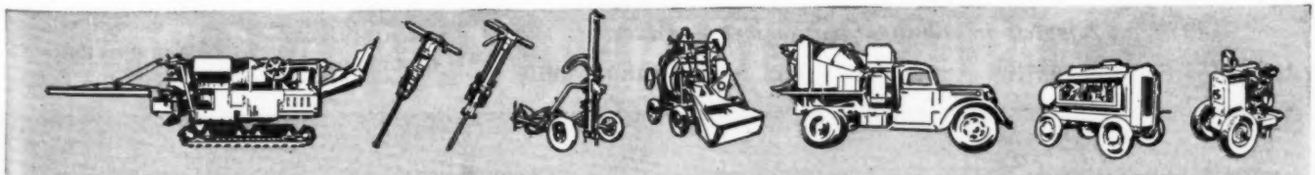

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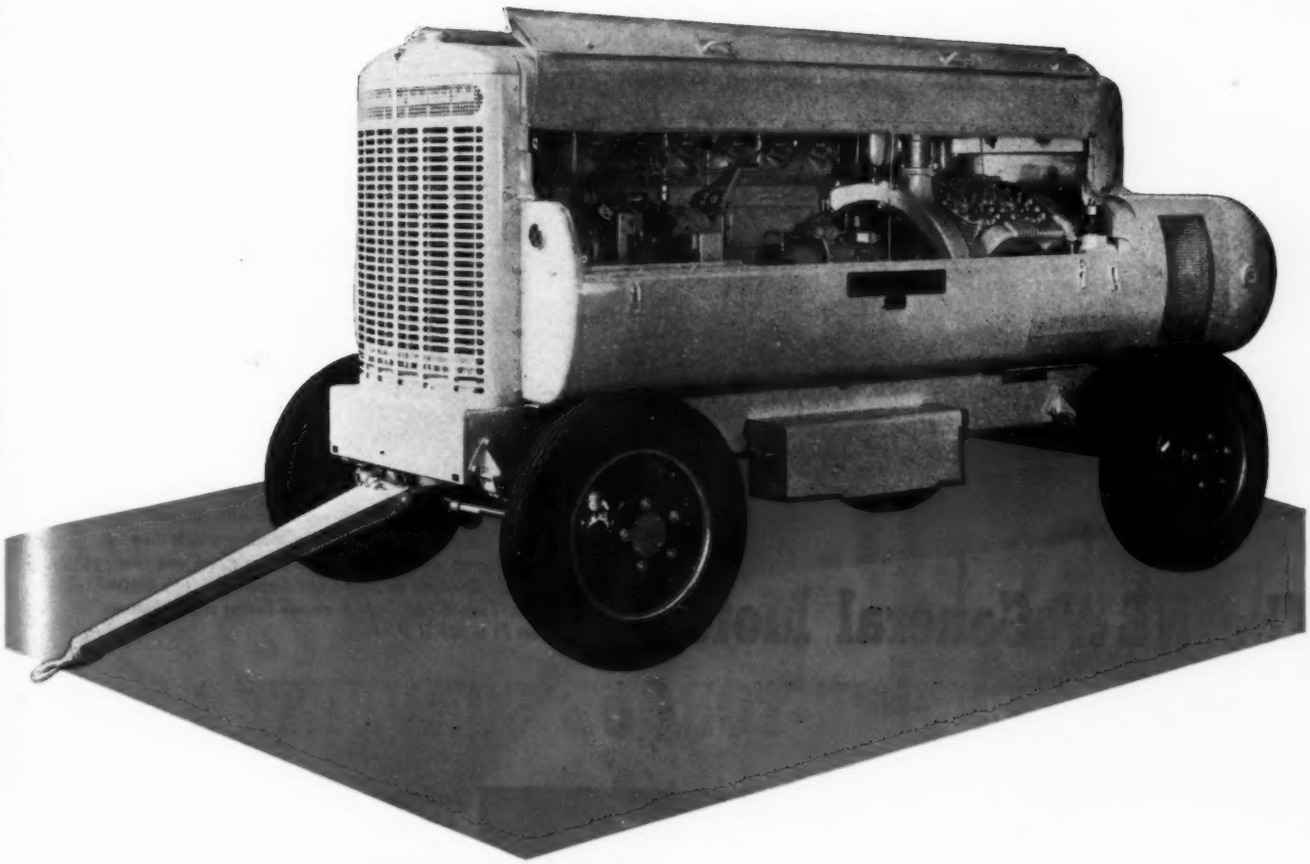

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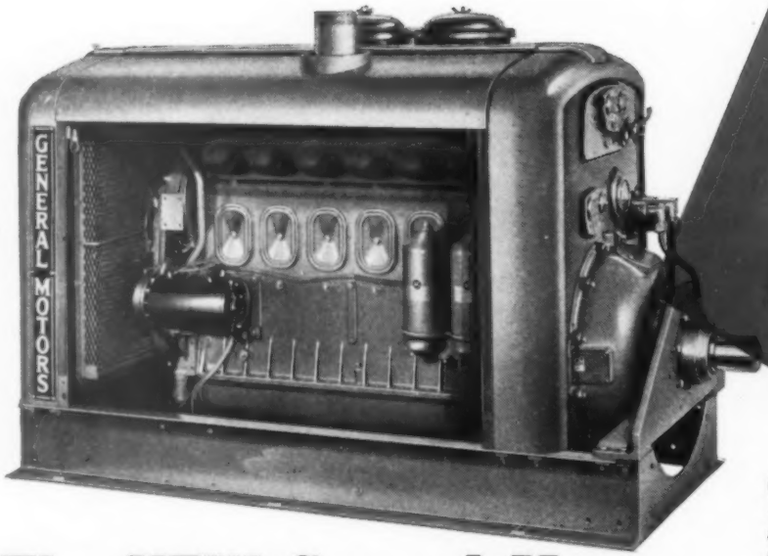
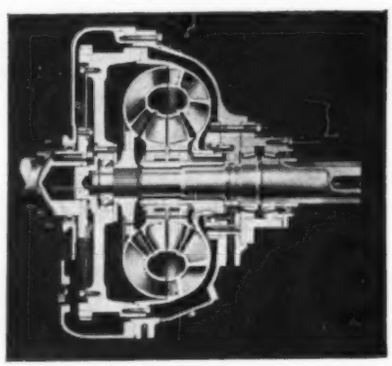


A Combination Torque Converter and Fluid Coupling *Integral with the Engine*

General Motors 71 Diesels equipped with the new GM Torque Converter take up no more space or weight than the same engines with conventional friction clutch and power take-off. Available in 3-, 4-, and 6-cylinder single engine units, Twin 4 and Twin 6 models having engine ratings from 75 to 300 H.P.

The NEW General Motors DIESEL ENGINE-TORQUE CONVERTER UNIT

HERE is a complete, integrated Diesel engine-torque converter unit that combines the inherent efficiency of the GM 2-cycle Diesel engine with the features and advantages of *both* torque converter and fluid coupling. It provides *torque multiplication up to 4 to 1* for starting variable heavy loads. It also provides *highly efficient transmission of power* during light load periods by *automatically shifting to fluid coupling* in the upper speed range.



In the new GM Torque Converter, oil does the work. Automatic transition from torque multiplication of 4:1 at stall to 1:1 in upper speed range.

A smooth, uninterrupted flow of power, delivered through a liquid, *prevents engine stalling* under any load and *protects both engine and driven machinery from sudden shocks.*

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Up to now most engines and hydraulic drives have been separate units. The result—compromise designs and divided responsibility. Now General Motors offers a new torque converter specifically designed and manufactured as an integral part of the General Motors Series 71 Diesel engine. It is a self-contained unit built by one manufacturer providing a long needed saving in space and weight as well as certain desirable operating characteristics not available before.

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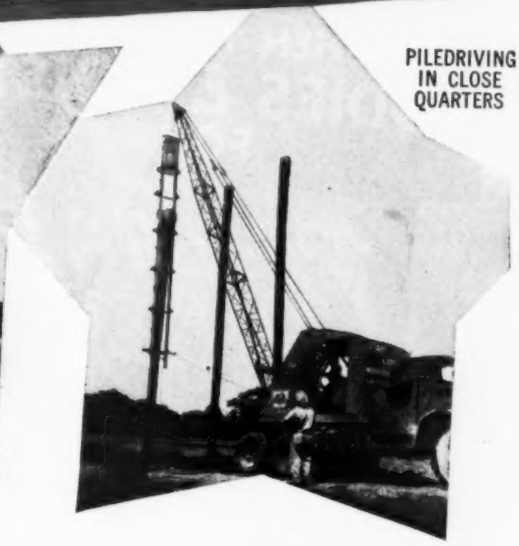
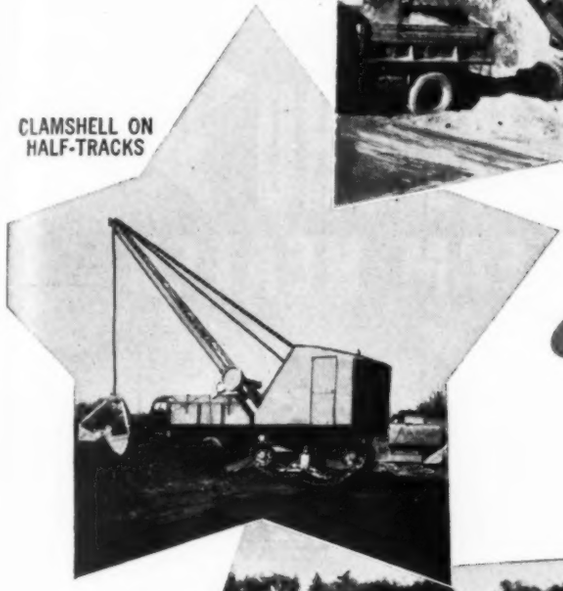
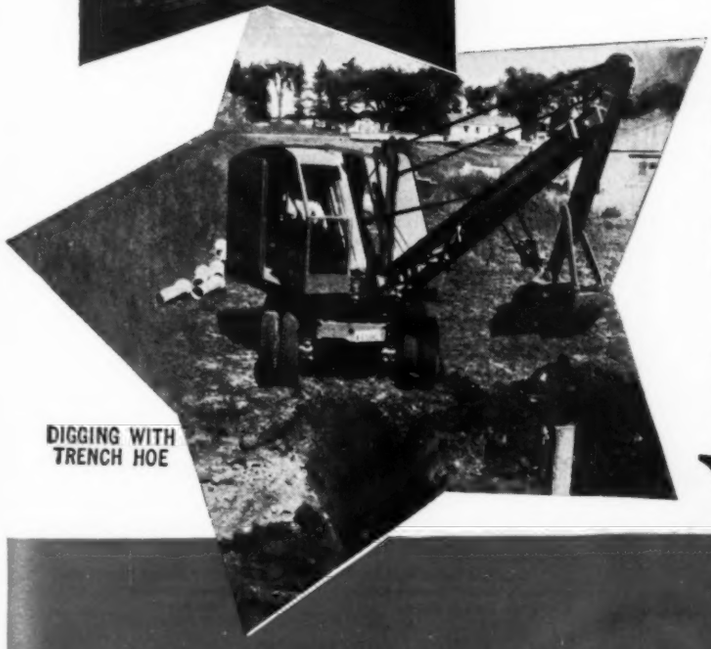


PILEDRIVING IN CLOSE QUARTERS



CLAMSHELL ON HALF-TRACKS



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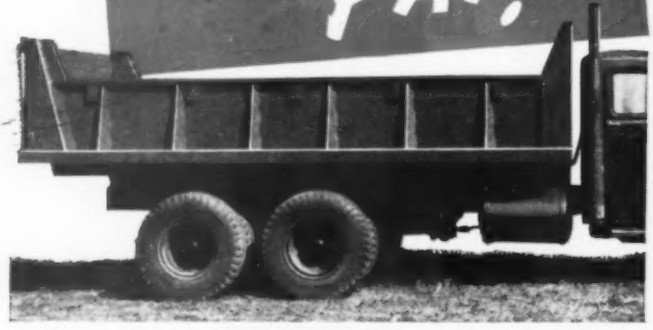

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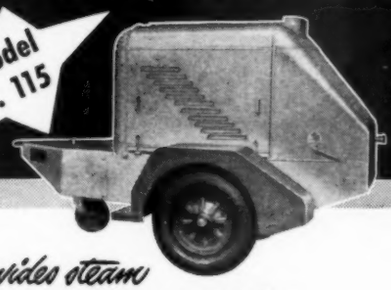

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FROM A COLD START Here's a steam producing unit for Unloading Tank Cars that gives 200 lbs. of steam pressure in two minutes time. It is the fastest steam producing unit on the market today. It's designed to unload tank cars of Asphalt, Tar, Emulsions, Cut-back, etc., yet can also be used for cleaning, thawing, pile driving, heating buildings, winter concrete curing and ore mining.

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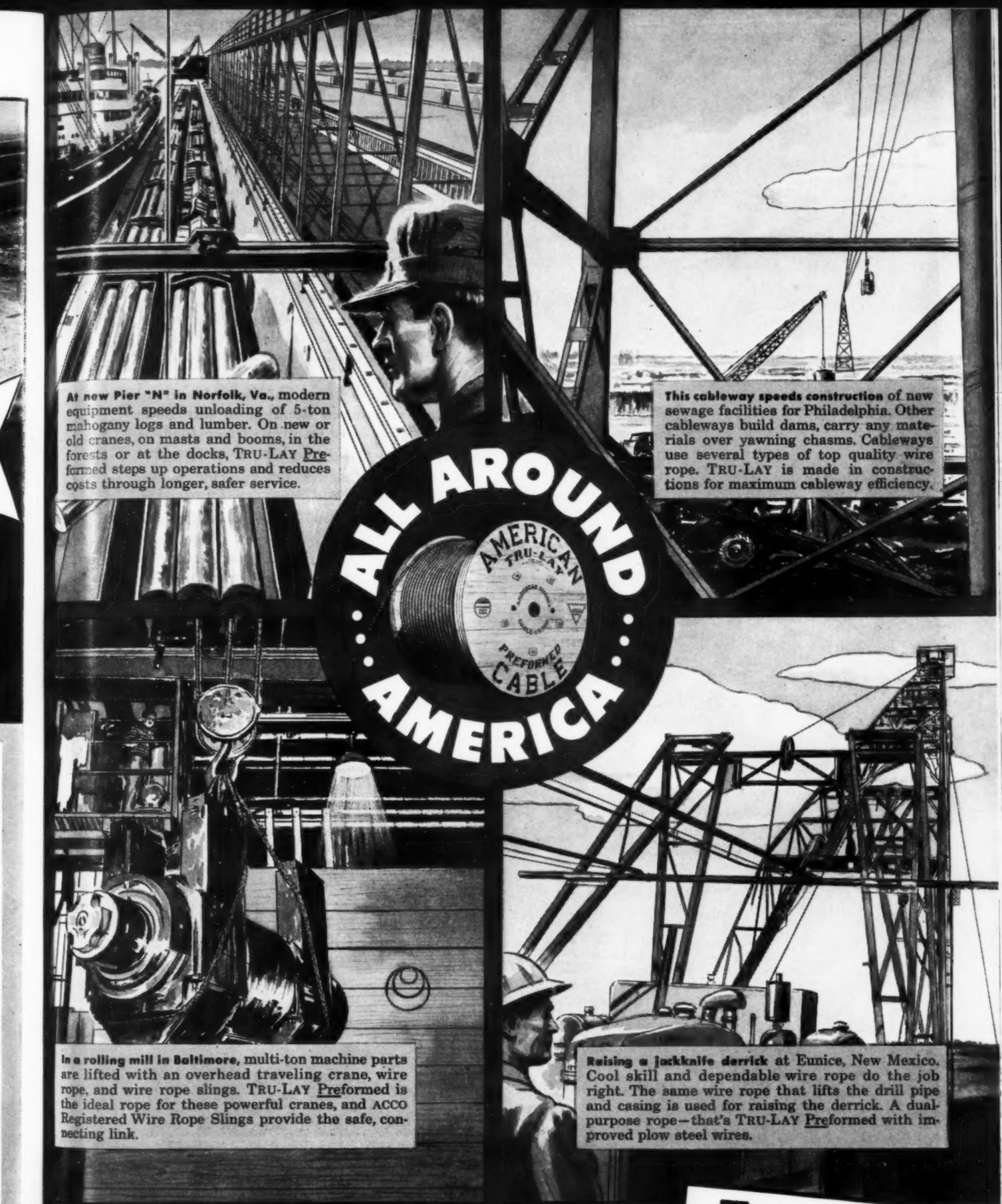
454 East Pearl St., Cincinnati 2, Ohio



At new Pier "N" in Norfolk, Va., modern equipment speeds unloading of 5-ton mahogany logs and lumber. On new or old cranes, on masts and booms, in the forests or at the docks, TRU-LAY Preformed steps up operations and reduces costs through longer, safer service.

This cableway speeds construction of new sewage facilities for Philadelphia. Other cableways build dams, carry any materials over yawning chasms. Cableways use several types of top quality wire rope. TRU-LAY is made in constructions for maximum cableway efficiency.

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In Business for Your Safety

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DAY in and day out, more and more yards are moved on Goodyear Earth Mover All-Weather tires. Experienced equipment operators know that this great tire is *right* for rolling yardage — right on schedule at rock-bottom cost!

Designed to carry maximum loads over all kinds of terrain, the large diamond pattern of the Earth Mover All-Weather distributes the load evenly to the carcass. The rounded diamonds reduce cutting and snagging, and the flat wide tread gives maximum flotation in soft going and even wear on firm surface roads — the nearest to an all-purpose tire that can be built.

That's why Earth Mover All-Weather tires — like *all* Goodyear work tires — are first choice with users everywhere. They stay *first* choice year after year because they keep on delivering low-cost, long-life performance.

This tire moves the earth on time!

A RIGHT TIRE FOR EACH JOB!

BUY and SPECIFY GOODYEAR — it pays!

EARTH MOVER SURE-GRIP for maximum traction on drive wheels

HARD ROCK LUG for super-stamina in all rock work

We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

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MORE YARDS ARE MOVED ON GOODYEAR OFF-THE-ROAD TIRES THAN ON ANY OTHER KIND

ROADS AND STREETS

February, 1949 • Vol. 92 • No. 2

Seven-Drill "Jumbos"

Make Short Work of West Rock Highway Tunnel

"Tunnel that will pay back the motorist for its cost" holed through on Wilbur Cross Parkway near New Haven, Connecticut, by L. G. Defelice and Son, Inc., and Gull Contracting Corporation, of North Haven, Connecticut

By E. T. Nettleton
Associate Highway Engineer, and

W. C. Maynard
Project Engineer, State Highway Department of Connecticut

TUNNELS aren't every-day projects in highway work, and because no two are alike in the problems they present, their design and construction are usually of more than passing interest. This is true of West Rock Tunnel, which was holed through recently as part of a new expressway location just outside New Haven.

West Rock and East Rock with cliffs several hundred feet high are barriers with quite a history. Colonists once used Judges Cave, at the top of West Rock, as a hiding place for the Regicides who were fleeing the wrath of the British Crown. The base of this rock later was the site of the first mechanical stone crusher in the United States. The city recently has spread from its base to the shore of Long Island Sound, and this fact, combined with the tremendous traffic growth, has created several serious traffic difficulties.

A Location Problem

One of these problems was the flow of traffic entering from the west and leaving toward the north. Three alternate routes were studied. The adoption of a southerly line would necessitate the acquisition or condemnation of expensive land and buildings, and the construction of many overpasses. The selection of a northerly line, through Bethany Gap, would require the construction of long feeder roads to handle traffic into New Haven. The choice of a central line would call for a tremendous amount of filling in order to go over West Rock. In desperation, the engineers decided to make a tunnel through the hill. This route shortened any alternate layout by seven-tenths of a mile.

The next pre-operation problem was the solution of the size of the incision. The Highway Planning Bureau estimated that the amount of traffic which would use the tunnel in 1950 would be approximately 13,000 cars per day, or over 4½ million cars per year. It was estimated that the

★ Details of jumbos and steel lining. Air supplied by 6-in. hose lines

★ Tunnels holed through as seen Nov. 8 (one tube at extreme left)

★ As the job looked on May 4. Five weeks of work with wagon drills to get approach grade and portal face roughed out

★ State highway personnel on tunnel job—M. B. Pearce, W. C. Maynard, A. H. Anderson, E. Coffrey, A. H. Supernor, F. Glenwood, J. A. Unger, Jr.

saving of 0.7 mile to the traveling public would amount to over $130,000 annually. The Design Section of the Bureau of Engineering and Construction considered three alternate plans: namely, twin-bore tunnels each 26½ ft. wide; a single bore tunnel 52½ ft. wide, with traffic separated by a 3-ft. raised strip; and a single bore tunnel, 26½ ft. wide, with the other half to be put in at a future date. During the design stage, the Department made five borings to determine the rock formations and type. It seemed evident that most of the rock to be encountered would be trap rock, although there were seams of sandstone. The first scheme appeared to be the most desirable, all factors considered.

Consequently, bids were received on twin-bore tunnels, each 1200 ft. long. The bores were located 63 ft. on centers. Each bore was designed for a 23-ft. roadway flanked by emergency sidewalks built out 2½ ft. from the vertical side wall. Steel bracing was to be used in the tunnels and the rock walls were to be lined with concrete and faced with tile. Ventilating shaft and electrical traffic controls were also included. Bids were opened Jan. 8, 1948, and contract awarded to the lowest bidder, L. G. Defelice and Son, Inc., and Gull Contracting Corporation of North Haven, Connecticut. The bid was $1,934,203.25.

Actual driving of the tubes began late in June, 1948, and the last blast was fired November 8, 1948. Both tunnels were driven simultaneously from west to east for the full length. Economic reasons dictated this choice, since the stone removed from the bores was needed for filling at the west approach. After the talus stone and loose rock were removed at the west portal, the tunnels were driven using a full face operation. Work was carried on in two shifts between 6 a.m. and 11 p.m. The personnel of each crew consisted of a walker, a shift boss, a nipper, 14 miners and 14 chuck tenders.

The contractor built two 7-drill jumbo rigs which were mounted on two Linn "half-tracks." The full face was drilled on about 3-ft. centers, averaging some 60 holes per heading. About three hours' time was required for drilling a full face. Ingersoll-Rand Carset bits were used in drilling and proved to be most satisfactory and economical. Two banks of Ingersoll-Rand compressors, one with 2800 c.f.m. capacity and the other 1200 c.f.m., furnished the necessary air for drilling operations. The air was carried from a receiver to the jumbo trucks through a 6-in. steel pipe.

The loading and wiring of the drill holes for the full face required about 30 minutes. Shooting was done using nine delays, with about nine seconds total lapse of time. About 2½ lb. of dynamite per cubic yard of rock was required. The dynamite used was Hercules 40 gelamite.

The average shot obtained a pull estimated at 11 to 12 ft., bringing down about 240 cu. yd. of solid rock.

About 30 minutes was required to ventilate the tube before excavation or mucking operations could be started. A 1½-yd. Lorain diesel shovel was employed for loading. This shovel was equipped with a shortened boom and stick, in order to operate in the confined limits of the tubes. Hauling of the material from the tunnel was accomplished by the use of three 6-yd. diesel-powered Koehring Dumptors.

Ventilation Details

The tubes were lined with 8-in. steel arch ribs and columns spaced from 2 to 6 ft. on centers. The exact spacing was determined by the conditions encountered while driving the bores. For the protection of his own personnel, the contractor elected to place temporary lagging between the flanges of the steel ribs. This lagging is to be removed prior to the concrete lining of the tubes.

During construction, the tubes were ventilated with air furnished by two 30-in. fans operated by two Sturtevant electric motors. This air was carried into the tunnel through a 2-ft.-diam. pipe, the end of which was kept approximately 50 ft. back of the heading. The Bureau of Industrial Hygiene of the State Department of Health periodically ran tests at various intervals to determine atmospheric concentrations of dust and carbon monoxide to which workers were being exposed. The contractor cooperated excellently throughout the project in conforming with correc-

★ Bits used by contractor on this tunnel were 2-in. Type 2 Carset Jackbits (Ingersol-Rand)

tions which were suggested for the health and welfare of the employees.

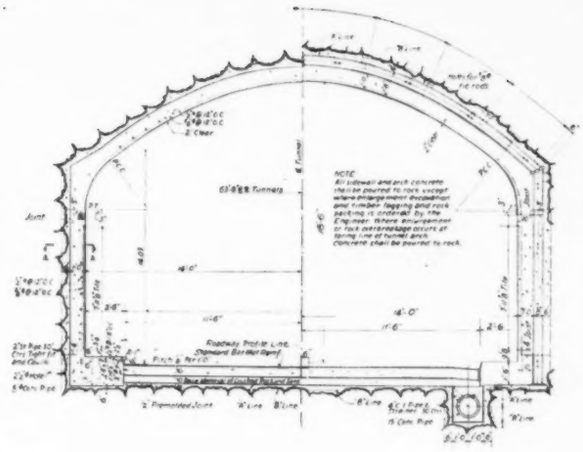
The temporary construction lighting consisted of 150-watt spot luminaries located about 30 ft. apart for the length of the tunnel. There was additional pan lighting employed on the jumbo trucks as they worked on the headings.

On the site, the contractor erected a 20′ x 20′ Butler building for a repair shop, a shed to protect the drill doctor, a saw mill, a welding plant, a large building which contained lockers and showers for the muckers, and an office for the engineers. The contractor used an existing house on the site for his office and for a first-aid room.

The contractor was confronted with the usual complaints from local residents which always accompany such construction operations. The noise of the blasts going off at various intervals was irritating and the vibrations from the blasts brought forth some claims for damages. Upon several occasions, seismograph recordings were taken by Dr. Donald Leete of Harvard University and his assistant, Randolph Jones. Then, again, the constant roar of the exhaust from the compressors and the jangle and crash caused by the spilling of their loads by the Dumptors added to the displeasure of the local inhabitants.

Job Holed Through

On November 8, 1948, the last blast was fired in the second tunnel. The usual "holing through" ceremonies took place. Speeches were made by Governor James Shannon and Highway Commissioner G. Albert Hill. The ceremonies were then transferred to a local restaurant where the customary toasts were accorded. These were followed by a dinner and an entertainment sponsored by the contractor.



★ Typical cross section of tunnel. Left half, concrete without steel supports; right half, with steel supports when required

Work still to be done consists of drainage, concrete tunnel lining, tile facing, permanent ventilation shaft, electrical and control equipment and housing, curbs, roadway and sidewalk paving. It is anticipated that the project will be completed about October 1, 1949.

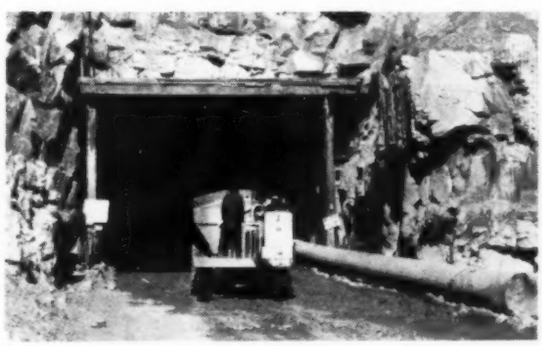
Personnel employed directly on the site by the state highway department consisted of W. C. Maynard, project engineer, H. E. Thorner, office manager, and W. C. Reynolds, A. Anderson and H. Robins, inspectors. In addition, there was a survey party of six men working under W. Z. Brandt, chief of survey. Officials, under whose jurisdiction this work was performed were R. E. Jorgensen, deputy commissioner; W. M. Creamer, director of the bureau of engineering and construction; M. A. Tyack, engineer of contracts and construction; and M. B. Pearce, resident engineer. The firm of Parsons, Brinkerhoff, Hogan and MacDonald of New York City acted as consultants for the highway department. The project superintendent for the contractor was J. Grillo. The officers of both firms in the joint venture were: L. G. Defelice, president and H. Defelice, vice president for the L. G. Defelice and Son, Inc.; Andrew Gull, president; and Anthony Gull, treasurer for the Gull Contracting Company, Inc.

New York Cuts Cost of Snow Removal to $96,055 an Inch

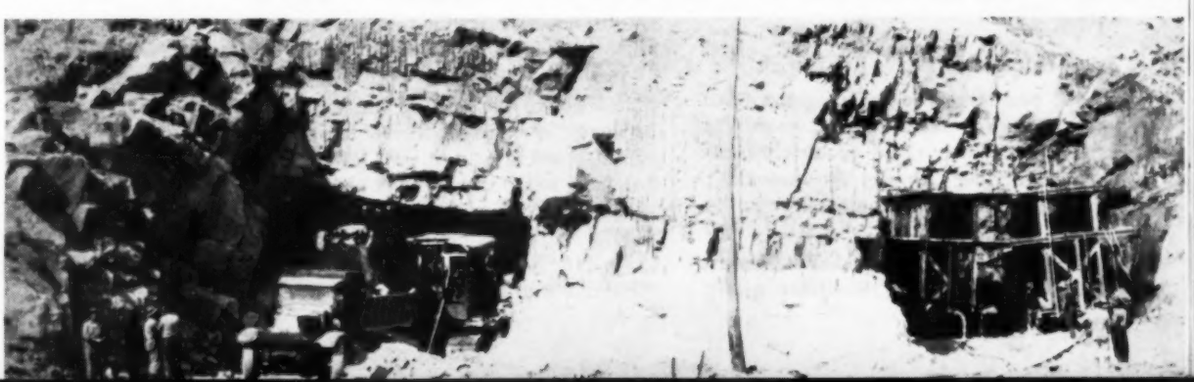
Nine days of snow removal after the 19.6 in. snowfall of Dec. 19 cost New York City $1,873,070 as compared with $4,692,308 for the first nine days of similar work after the "big snow" of 25.8 in., in December, 1947.

In a report to Mayor O'Dwyer, William J. Powell, sanitation commissioner, attributed the cost of reduction of $2,819,238 to increased efficiency of man power.

A statistical tabulation estimated that the snow removal job in 1947 cost $181,872 an inch as compared with $96,055 an inch this year. The $1,873,070 cost of clearing up the Dec. 19 snowfall took into account an increase of 10% from the 1947 rates for labor and rented equipment.



★ Six-yard Koehring Dumptors carried the stuff out of the tunnel, their quick dumping action, no-trim shuttle operation, and maneuverability doing much to expedite the job



★ At start of tunneling — June 17, 1948. Note short-boomed shovel and jumbo frames

EDITORIAL

★ Socialism or Private Business in Road Work?

Last month on this page the spotlight was turned on the seemingly growing custom of performing, by public employes (force account), road work which under our American scheme of living should be performed under contract. As a nation we're shelling out billions to bolster world belief in this democratic principle: the people shall do the business and not the government. While here at home the various government bodies from federal to township are digging in deeper and deeper.

Some Capable Administrators

Last month's editorial didn't set well with some state and county engineers of our acquaintance, we realize, and we expected that. Certain of them happen to be exceptionally good managers, and no doubt they achieve fairly good efficiency in organizing and directing large force-account programs of new secondary road construction, stabilization, resurfacing, heavy repairs and what have you. Probably in their particular state maintenance districts or counties, contractors currently would have to hump to show lower costs than these fellows, what with taxes and all.

But for each public official who is an outstanding organizer, leader and driver, many others are just ordinary good guys. They do a splendid work in their professional engineering careers, and by and large our highway departments are as well managed as any large bureaucracy can ever be. For the great majority of states and counties, however, the belief is restated that if the engineer were to make an honest effort to attract contract bids on road construction and heavy rehabilitation, both primary and secondary, he'd give the taxpayers more for their money.

Suggest More Research

No one advocates cutting the road maintenance departments down to zero. Just keep them to a workable level, for performing the extensive and varied duties that must inevitably be done by career personnel.

Highway maintenance has become a 1-1/3 billion dollar business giant. The R&S editors will constantly publish examples of road department mechanization. Highway departments, like contractors, must strive harder to increase the productivity of every worker. But machines alone aren't the answer. Incentive—economic pressure—the profit motive. These hold the real answer, and unfortunately you don't find them among public payrolls. The only sound objective is to strive toward less rather than more publicly-performed highway work. Contractor groups too have a responsibility here in the quest for efficient and economical performance of work.

Many of the college highway short courses and county engineer meetings this winter are taking up problems of administration. County engineers, as well as state highway leaders, are rightly recognizing that a sound set-up and good administrative methods constitute the "cart before the horse," the horse being efficient road construction and maintenance. These men along with state road leaders are counseled to establish definite continuing research in contractor relations that will assure active contractor interest and efficient performance.

Following this article there is reprinted a thought provoking analysis of this "public-vs.-private" business, as seen from the vantage point of conditions in a particular state where force account activities have reached $14 million annually.

★ Give Contract System a Chance

(Editorial in *The Carolina Road Builders*)

It is safe to say without fear of contradiction that a stabilized highway construction industry is a basic asset to the over-all economy of any state or nation. To jeopardize the stability of this important industry will curtail, slow down, and increase the final cost of the ever increasing need for an expanded highway modernization and construction program, thereby affecting the over-all economy of the state as a whole.

Highway modernization and construction is one of the largest businesses of the state and nation in existence today. The success of this improvement and construction program is wholly dependent upon the various branches of the highway construction industry. By the same token, various branches of the highway construction industry are in a large measure dependent upon the highway modernization and construction program of the state and nation.

The fact that the state highway officials have been practicing socialism by carrying on a considerable amount of this program with day labor state forces is beginning to be a continuous handicap to private industry in preparing for an expanded highway program. In North Carolina alone, construction and betterment work by day labor forces of the type ordinarily let to contract under the competitive system has amounted to approximately fourteen million dollars during the calendar year of 1948. This amount is approximately 50% of that let to contract by the competitive bid system. With the day labor state forces method increasing year by year, coupled with the ever increasing demand for new construction equipment purchases by the state, it is hard to see how the average contractor can possibly afford to gamble on the possibility of expanding his forces and equipment outlay to meet the increasing demand for highway construction.

The State Highway and Public Works Commission of North Carolina, since the beginning of the so-called postwar highway program, has purchased over nine million dollars worth of new equipment. This outlay of equipment, a large portion of which is used on construction and betterment projects in competition with the contract system, was purchased at a much lower figure than it could have been purchased by the individual contractor.

The estimated program to be inaugurated in this state alone would justify the expansion of the facilities of many of our specialized contractors

if they could depend on the initiative of private enterprise to serve economically the people of the state in carrying out this program. However, with the present attitude of highway officials toward the day labor state force system and their increased desire to create a large pool of construction equipment, it is evident that the individual contractor cannot afford to gamble his forces and capital against the forces created by highway user taxes expended to his disadvantage. The highway industry must first give the contractor an opportunity to show that by the competitive contract system of construction and betterment the highway user will receive a better and less expensive type of highway improvement and construction.

To be pessimistic, we could say the present trend in all levels of government is toward our government's being the government of the government, by the government and for the government in lieu of the tradition that government shall be of the people, by the people and for the people.

The controls and final absorption of private enterprise are reaching rapidly into the highway construction industry by the ever increasing policy of the state, county and municipal government to construct roads, streets and airports by the day labor force account method.

★ All Eyes on Legislators

Roads are designed and built by engineers and contractors. But they're legislated and financed by those nontechnical gentlemen, your state legislators and political party chiefs, including, of course, your governor.

These individuals, and similarly the county road commissioners, have it in their power to make or break road programs—and to express, badly or well, the sometimes meagerly defined wishes of the people whose wish at the moment is to burn up 400 billion vehicle-miles annually in 41 million cars and trucks.

This year in 44 states the state legislatures are rolling up their sleeves. Fortunately, in most states, highway questions will be taken up. Curbs on diversion, proposals for long-range planning of highways, toll road issues and tax increases will get consideration.

In about 30 states attempts will be made to increase gasoline taxes or other special levies on the highway user, notes a bulletin from the National Highway Users Conference. Almost as many legislatures will be urged to begin long-range highway planning under their auspices or will examine plans already prepared by legislative interim committees or other groups. All are agreed that such examination of highway planning, embracing the correction of fiscal abuses (such as diversion, dispersion and scatteration) and administrative faults, are fundamental to real highway advancement. Such planning will show how much new highway money is necessary, as well as measure actual road deficiencies and needs, and should embrace means of raising funds that will be just and fair to all.

Here is where the serious differences start. We are unanimous on the generalities of highway need. But who's right about where to get the money? Of deep concern to all highway users is the epidemic of toll road promotion. Where will it end? New Jersey was last. Who's next? User groups will ask for the repeal of toll road legislation in Colorado. Another traffic survey is to be made for the proposed toll road in Oklahoma. Remember that toll road operators must charge as toll an equivalent of 15 to 20 cents per gallon of fuel used in traversing their roads.

Anti-diversion amendments will be introduced in eleven states during 1949. No quarrels there!

Uniform traffic regulations, patterned after the Uniform Code, are contemplated in nearly 30 states. Again, good work!

The big questions are long-range planning, and new financing legislation. Gasoline tax rates have stood still in most states while the cost of everything else has doubled. Maybe higher gasoline taxes aren't the best answer. Maybe they are.

But *some* permanent or at least stop-gap source of added road funds must be found in nearly every state. And it should be found this year.

★ The Poor White Collar Guy

The average hourly wage rate during the last quarter of 1948 on Federal-aid highway work was $1.85 for skilled labor, and only $1.76 for executive, administrative and supervisory personnel. Assuming that the E., A. and S. personnel are supposed to be smarter people or they wouldn't be bosses, it is certainly "smart to be ignorant" these days, with apologies to a certain Saturday night radio program.

A similar condition prevails in many other industry lines besides highway work. White collar people always get hit hardest by a price boom. The picture in construction is all the more distorted since skilled workers demand and get many hours of overtime today at premium hourly rates.

Iowa Group Forms Roads Association

The newly-formed Iowa Good Roads Association began its career in January with the naming of C. C. Coykendall, Ames, retired administration engineer of the Iowa highway commission, as executive secretary.

The purpose of the organization is "to promote the construction of good roads" throughout the state, executives said.

Coykendall, a highway commission engineer for nearly 35 years, will head the association's offices established in Des Moines, Iowa. He is past president of the Iowa Engineering society and the Mississippi Valley conference of State Highway departments.

Other association officers named were Charles T. Cownie, Des Moines, president; John W. Coverdale, Waterloo, vice-president, and Neal P. Hammer, Newton, secretary-treasurer.

The new association has taken no official action on adoption of a road study report made by an Iowa legislative committee. The report, which was submitted to Gov. Robert D. Blue in December, calls for expenditure of 88 million dollars to improve primary, secondary, farm-to-market roads and municipal streets.

●

Highway Travel Increase in 1948—Travel on the nation's highways increased from approximately 370 billion miles in 1947 to an estimated 395 billion miles last year.

●

Minnesota Program Largest Since 1932—The State highway department of Minnesota placed under contract in 1948 more than $23,000,000 worth of trunk highway construction projects. In dollar volume this is the biggest construction program contracted in any one year since 1932.

Expressways

Some Cities are Beginning to Get Them

Expressway Construction Progress in U.S. Cities

Where does your city rank in the all-American handicap race to get limited access projects built and carrying traffic? Continuing a series, this time bringing R & S readers a quick picture of latest developments on the urban expressway front in a score or more larger cities. Read and compare notes.

By Harold J. McKeever
Editor, ROADS AND STREETS

HOW are expressway programs and projects coming along in our larger cities?

Fact is that more actual construction progress has been made since the war than most of us dared to expect. Steel shortages have hampered the work, since the many grade separations required have usually had to be started first. And cement scarcity is now an added factor. All along there's been a lack of qualified designing personnel to handle the complex, specialized problems of urban limited access highway development. And then there's been the long-drawn-out work of getting enabling legislation, financing, rights-of-way, and making elaborate economic, traffic and location studies.

Despite all these inherent slowing elements, scores of projects in the million-dollar bracket are under construction. According to PRA figures, expressways with controlled access were expected to absorb 52.4% of urban highway funds available to the states for the 1948 fiscal year. Another 10.8% will go for grade-crossing elimination projects, which often figure into expressway plans. And 15.7% will go for arterial widening. Clearly the urban federal-aid funds are being expended to do a main-line traffic relief job, as intended; with emphasis on expressways, which the experts agree is the most urgent as well as soundest procedure in most urban areas today.

Following is a brief resume of Chicago's expressway work to date, together with telegraphic progress "flashes" from a score or more other selected cities, as compiled by the R & S editors with the help of the PRA staff in Washington.

Chicago. The people of this congestion-weary metropolis have heard tid-bits of news, and seen elegant wash drawings in the papers now and then. But by and large they have no inkling of the very substantial start made since the war to carve non-stop expressways across the Chicago map.

The "initial" plan calls for a radiating system of 67 miles. A 33-mile "immediate" program takes in (A) Congress Street, or "West Route" lake front west to city limits; (B) Northwest Route; (C) South Route, downtown to 95th; and (D) Wacker

Highway to Run Through Post Office at Ground Level
U.S. Post Office
Board of Trad
Transportation Building
Arcade Sidewalks to Be Built Into Lower Floor of Buildings
Congress Hotel
Roosevelt College

Photo Chicago Sun-Times

★ Congress Street, or West Highway (looking west), will cut through some mighty expensive real estate to help Chicagoans enter and leave the downtown area. These scenes show some of the details, which include twin bascule bridges and an elaborate ramp east of the Post Office, then tunnels through the Post Office. Sidewalks will give way to cut-back arcades along buildings in the two blocks immediately west of Michigan Avenue

Drive extension around west side of downtown "Loop" district. This priority program the city "hopes to build in 10 years," according to Dick Van Gorp, chief engineer, department of subways and superhighways, City of Chicago, who, under commissioner Virgil Gunlock has been directing a large staff of designers and right-of-way experts on the tedious and costly preliminary work.

In general, the expressway program is being carried out under a city-county-state deal in which each shares one-third of the cost, with federal-aid highway funds figuring in the state's share. Agreements between the parties have been entered into for 30 miles of work. Chicago's share is coming from a portion of the city's 1 cent cut in the state motor fuel tax (presently totaling about $6,000,000 annually) plus bond proceeds ($42,000,000 voted in 1946).

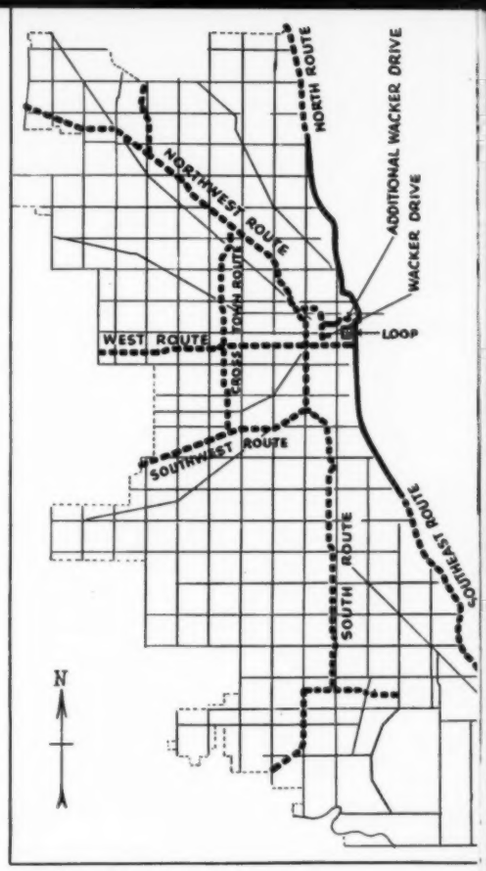
Congress Street First

To date all forces have concentrated on the West Route. It is divided into three sections, each to be handled by one of the three agencies. The city took on the formidable task of designing and building the downtown leg, from State Street 2 miles west of Ashland. The section from State Street to the Chicago River has been cleared, and demolition is now proceeding west of the river. The city, acting as agent for the state, has acquired most of the real estate for the next 1.75-mile leg westward to Sacramento. Over 875 property parcels have been acquired for $8,500,000, the city and state roughly splitting the over-all cost. This job has taken 4½ years and has proceeded with no organized opposition, as property owners and businessmen on Chicago's west side have readily seen the benefits.

The highway developed land between State Street and Michigan Boulevard, two blocks, is also in the real estate process, and the county is now busy on right-of-way negotiations for the 3.5 miles from Sacramento west to the city line.

Construction Plans, Too

The designers, too, have been busy, and today plans are completed for pavement, drainage, lighting, etc., from State Street downtown to the Chicago River eight blocks west, and nearly completed for the elaborate plaza to be built between Wells Street and the river which will be the downtown terminus for most expressway users. On the theory that money spent for engineering is the cheapest, no pains have been spared to analyze the many ramifications of this complicated project-within-a-project.



★ "Map of Hope" for Chicago motorists—the comprehensive general plan of expressways. Broken lines show new routes planned

WEST
Dotted Line Shows Land Being Purchased for Congress St. Highway
Halsted St.
Van Buren St.
Des Plaines St.
Subway Tracks Come Above Ground Here to Continue Westward in Center of Highway
U.S. Post Office

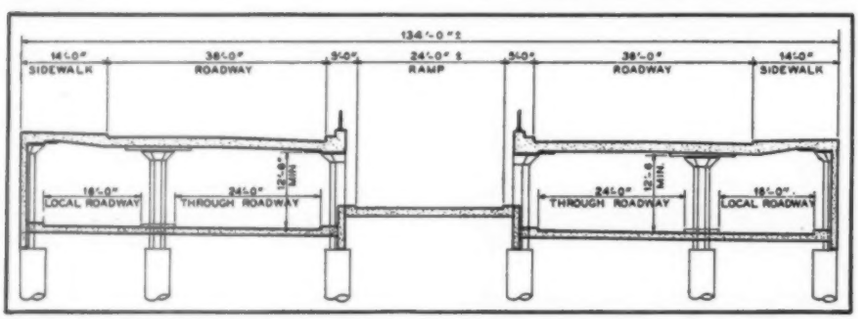
At the river, twin bascule bridges will carry the express roadways at elevated level. Their design is under way in the offices of the city bridge department, under Stephan Michuda, bridge engineer and city engineer W. W. DeBerard. This item will cost some $4,000,000.

Next westward is the unusual device of threading the twin roadways at grade literally through the big Central Post Office building, for which passages were provided in the original construction some years ago. Minor alterations of ramps in progress here.

Engineering plans are in varying degrees of completion from here westward for several miles. The expressway will be on viaducts to Des Plaines, then drop to a depressed design that will prevail to the city limits, with service roads flanking. Design of a special storm sewer system for the depressed section will be no small part of the total job. This system will have its own collecting and pumping facilities, for discharge via its own mains into the Chicago River.

From Racine Avenue west to Sacramento an existing elevated line will be temporarily relocated on a timber and steel trestle along the top of the cut. After completion of expressway work, the electric line will then be permanently located along the center mall.

This sketch merely highlights Chicago's situation, where first contracts



★ Looking south along the proposed Wacker Drive west extension, as seen by the artist. Civic Opera building in foreground. Two-level construction to cost over ten million dollars a mile

are planned to be let in 1949. The state is already busy on extensive construction down on Calumet Parkway near the city limits, on the axis leading toward Gary and Detroit.

Plans are well advanced in the city's superhighway office for Wacker Drive extension. This spectacular project, only 0.8 mile long, will carry the present 2-level scheme around the west side of the "Loop," past the Civic Opera building, and southward. The three agencies will finance the job jointly, and contracts will be let for a block length at a time. The cost will include $3 million for R/W and $9½ million for construction.

Denver. The long-discussed north-south Valley Highway will begin to take form during 1949 with construction of a grade separation.

San Francisco. A new trans-bay toll crossing is about to be decided upon at this writing, with a $155,000,000 bridge parallel to the present bridge expected to be agreed on first. Integrated with this bridge is a proposed system of freeways and arterials for the Bay area, for which $8 million of a total immediate expenditure for rights-of-way in San Francisco has already been spent. Down-peninsula section of the Bayshore Freeway is completed. Structure contracts have been let for part of the East Shore Freeway through the Oakland side.

Providence. A report has been presented for an expressway westward from Olney Square downtown, but no construction begun.

Boston. A $6 million contract is under way for approaches to the Mystic River Bridge, part of a metropolitan expressway program. An East Boston elevated highway also projected. See later issues of R & S for more details.

Cincinnati. Two miles of roadway was placed under contract last fall for expressway-type construction to cost $3,000,000. Another 5 miles will be undertaken at about $13,000,000, as funds become available.

Cleveland. Six miles is under contract, some work dating back over several years. The state department of highways is concentrating on 6 miles additional, to cost about $40,000,000. Chief concern expressed is over getting sufficient length of continuous roadway completed to start giving real traffic relief. The problem of getting joint action between some 60 local governing bodies in the Cleveland area has hampered expressway planning, sharing of cost being one crux of the problem.

San Antonio. Under construction or completed, 3.5 miles of depressed expressway with 17 structures, at $7½ million. Some beautiful bridges.

Houston. Eight contracts — 4.3 miles—$8 million, including 6 bridges [see several recent articles in ROADS AND STREETS]. More contracts soon.

Fort Worth. After delays from local citizens, construction now 82% done on 2 miles of N-S expressway; started on 4 miles of E-W expressway.

Dallas. Has 3.8 miles under contract, including 8 bridges—again, beauties. Most of right-of-way acquired for 10 miles—feature to be the so-called Central Boulevard.

St. Louis. Also slow in starting. First project to consist of 1½ miles of 6-lane freeway, on U.S. 66 axis in town. Retaining walls costly design element, made necessary by right-of-way restrictions. Also a long viaduct. Begin construction summer 1949.

Kansas City, Mo. First letting held for a 3000-ft. viaduct, part of an initial mile of a 3-mile freeway to be called Southwest Trafficway. More lettings due in spring months of 1949.

Atlanta. Early in the war this city had a brave plan for an elevated expressway straddling a railroad right-of-way on steel bents. Gone with the wind. Today a North-South expressway through the city is contemplated, 13 miles long. Roadway and structures for 1.3 miles of 6-lane-divided, limited-access construction has been

- **Urban expressway plans must be planned with adequate right-of-way width, warn PRA engineers. Otherwise retaining wall cost and other complications will more than offset apparent savings in land.**
- **Mass transportation likewise is an element that should be given full consideration. Maximum use of limited buses and other transit facilities will ease the traffic load and reduce the cost of an adequate expressway program.**

awarded, according to W. R. Neel, state highway engineer.

Portland, Ore. Expressway construction within the city, under the state-federal program, consists of a 3.3-mile unit on U.S. 99W. Called Harbor Drive, Interstate Avenue, and Barbur Blvd. along various parts of the location, it will cost $2,500,000 for R/W and $5,400,000 for construction. As of October 18, this project was 45% under contract.

According to R. H. Baldock, state highway engineer, the state forces have begun work toward acquiring rights-of-way for the "Sullivan Gulch" section of U. S. 30 through Portland. The 5.2 miles within the city will cost some $2,750,000 for rights-of-way and $5,000,000 for construction.

Philadelphia. A new major bridge over the Susquehanna River under way. The state, after much unavoidable delay, is beginning preliminary work on the first true controlled-access expressway, which will extend from the east terminal of the extended Pennsylvania Turnpike to the Schuylkill River near Conshohocken, thence along the river through the city. Engineering work has been assigned to consultants as a means of augmenting state forces.

In discussing the Philadelphia situation, E. L. Schmidt, chief engineer, state department of highways, said that most of the state's effort during the past few years has had to do with paving, resurfacing and widening existing streets. The only other urban project for the early future is the proposed Pennsylvania Boulevard, which will extend from the Broad Street Station to a connection near 32nd and Market.

Pittsburgh. The first roadway contract and several structures for an outlying section of the Penn-Lincoln Parkway have been completed. The $14 million Squirrel Hill Tunnel is finally under contract. [R & S, Sept., '48]. Several spectacular concrete arch or other type bridges, likewise. The real show is yet to come, however. The Parkway will eventually skirt the city's famous congested "Golden Horse Shoe" downtown district, in a design that in the words of Mr. Joseph Barnett of PRA will involve probably the most complicated interchange problem thus far encountered anywhere in the annals of modern highway engineering.

Baltimore Makes Start toward Expressways

An example of results after long discouragement is the recent progress made toward an expressway program in Baltimore. As reviewed for ROADS AND STREETS by Paul L. Holland, director, Baltimore department of public works, the state general assembly, in special session of 1944, authorized the expenditure of $20,000,000 for Through Highways in and through the City of Baltimore. Of this amount, $10,000,000 was authorized by ordinance of the Mayor and City Council and approved by the voters in November, 1944.

After considerable study, many meetings were held with individuals, groups of interested parties, etc., and a tentative route for the Express Highway was chosen. Authority was granted by ordinance which was approved in May, 1946, for the expenditure of a certain sum for field surveys and preliminary plans along the route of the proposed Expressway, a distance of about 9 miles. By the end of 1946, 75% of the undertaking was completed.

In order that the city would be eligible for Federal funds for urban highway construction, additional ordinances were introduced in the City Council to cover the cost of detail plans and specifications along the route surveyed. Due to the protests of property owners affected, and after some revision in the route, these ordinances failed to receive Council approval.

Additional ordinances were introduced in the Council for authority to proceed with detail plans and specifications for a portion of the Through Highway designated as the Southwest Leg. The construction of this section, from the Southwest Boundary line of the city, northeasterly 2.5 miles, was opposed by the owners of property along the route proposed and likewise failed to receive the approval of the Council.

After further deliberation, the so-called Southwest Leg was modified, and a section extending from the Southwest City Boundary northeasterly, to connect with an existing wide highway, a distance of 6,850 ft., was accepted and approved by the City Council. Approximately 90% of the property necessary for construction of this section has been acquired, and consulting engineers have been engaged to prepare plans and specifications for the several bridge structures which will have to be constructed within the limits of the project. Contracts for two of these structures have been let, and a third was to be awarded by year's end.

The highway, as proposed between the above-mentioned limits, is planned for two 40-ft. concrete lanes separated by a 10-ft. median strip with 15-ft. shoulders on each side. Contracts for grading and paving for this section within the city are expected to be advertised for bids in the very near future.

This section of the Through Highway in the City will be a continuation of the projected Washington-New York Throughway, the greater portion of which is now under construction in Maryland by PRA and the Maryland State Roads Commission. This highway, when completed, will supplement the present section of U.S. Highway No. 1 between Washington and Baltimore.

Color on Leadoffs Helps Prevent Highway Accidents

In a determined effort to reduce traffic accidents along heavily traveled highways, the California state highway department has approved the application of concrete coloring to sections of the new Cabrillo Freeway entering San Diego. As shown by the photograph above, the coloring is applied to highway leadoffs, thus making them more easily visible to approaching motorists. The coloring material used on the job was Kemiko concrete stain (Kemiko) or chemical solution which penetrates and through chemical reaction becomes a permanent part of the concrete. The color selected for the Cabrillo Freeway is a deep reddish brown.

Photo Calif. Div. of Highways

Freeways in San Diego

Cabrillo Freeway has recently been completed under district engineer E. E. Wallace for a length of 7 miles at a cost of four million dollars. The freeway has already demonstrated its ability to carry easily the maximum daily traffic of 24,000 vehicles, with a peak hourly count of about 2700. This has resulted in great relief in traffic congestion for the parallel city streets.

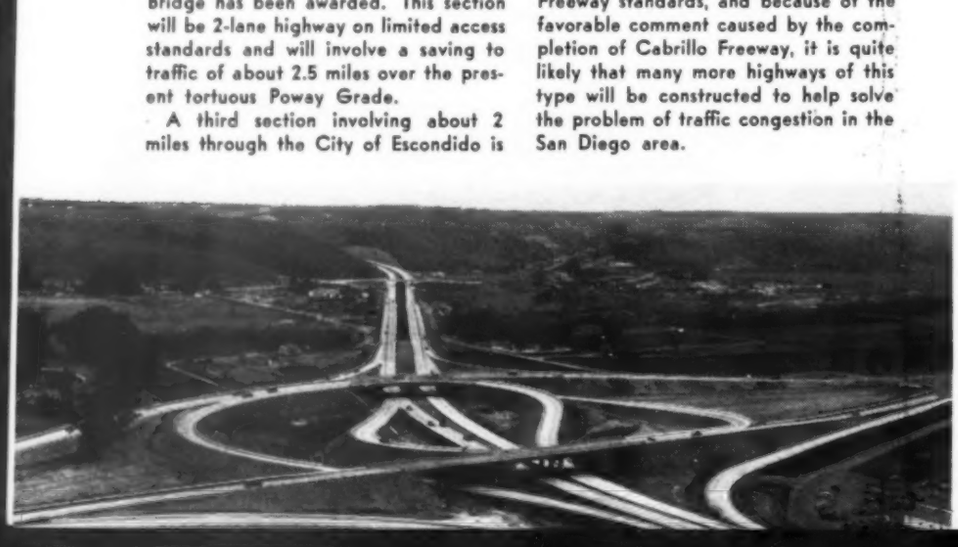
Additional work is in progress, or about to be advertised, on the extension of U. S. 395 through the balance of San Diego County. A section about 6.5 miles long, from the end of Cabrillo Freeway at the north city limits to the town of Miramar, will be constructed as a 4-lane divided highway on limited access standards. Two miles is through Naval property.

Another contract for 12 miles extending from Miramar to Lake Hodges Bridge has been awarded. This section will be 2-lane highway on limited access standards and will involve a saving to traffic of about 2.5 miles over the present tortuous Poway Grade.

A third section involving about 2 miles through the City of Escondido is being built as a 4-lane divided freeway. This section will eliminate several right-angle turns and congestion through that suburb, and will receive landscaping and beautification treatment.

The balance of U. S. 395 from Escondido to the Riverside County Line has been built on an entirely new location and involves a saving to through traffic of about 11.5 miles in a length of 23 miles. This section has been completed on 2-lane limited access standards. *The entire improvement of U.S. 395 will result in a saving to traffic of 14 miles, and because of the improved alignment and grades, will result in a reduction in travel time of more than one hour.*

Both the City and County of San Diego have plans for the improvement of other highways around San Diego, to Freeway standards, and because of the favorable comment caused by the completion of Cabrillo Freeway, it is quite likely that many more highways of this type will be constructed to help solve the problem of traffic congestion in the San Diego area.



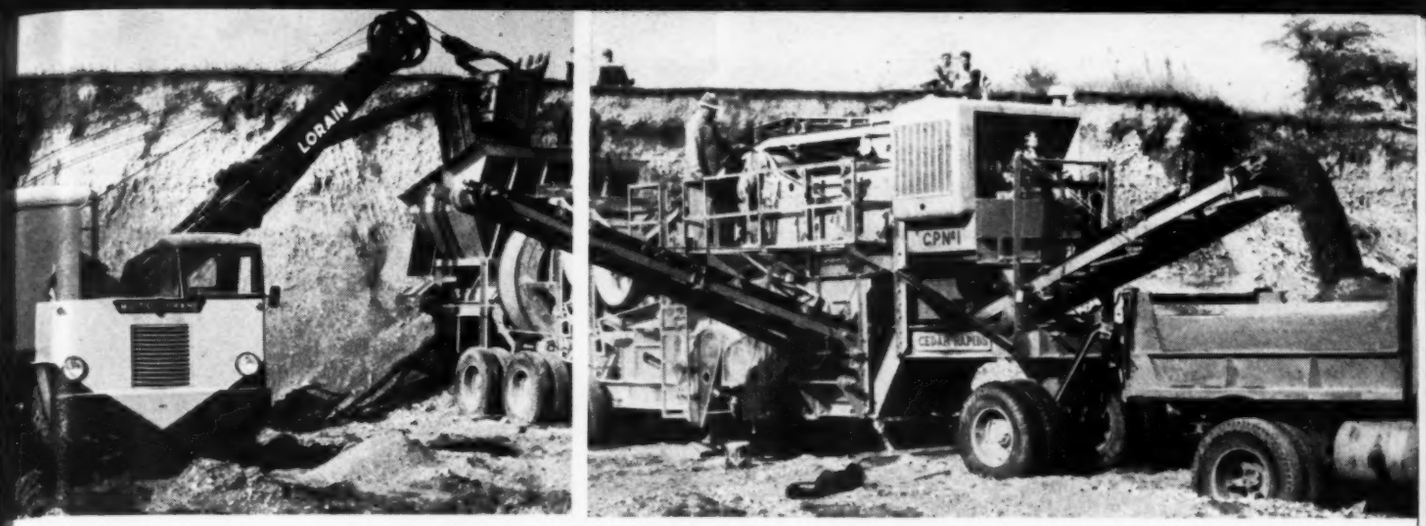
Los Angeles. This metropolis still leads the nation in expressway progress, with a score or more of structures under construction along the Hollywood and Harbor Drive freeways, and work beginning on roadways. The famous 4-level interchange is well along toward completion [R & S. Sept., '48]. The early wartime section of the Santa Ana Parkway, over the viaduct from downtown is also being extended. Goal: An eventual 2-axis, 70-mile system as a first phase.

Seattle. A comprehensive O-D survey has been made, according to state highway director Clarence B. Shain. A need is indicated for two North-South expressways through the city. A plan has been developed for improvement of the Alaskan Way, as the first unit, to extend along the west margin of the central business district. Construction plans and real estate work are in progress. Also the city envisions a by-pass express route east, or back of Lake Washington—3.5 miles under contract.

New York State. While slow progress has been made to date on urban arterials through the larger up-state New York cities, this phase of state highway development is in excellent hands. The bureau of urban route planning of the N. Y. state department of public works is in the midst of a program that is in many respects unique. Beginning with Buffalo, then extending to Rochester, Syracuse, Utica and other larger centers, the bureau in cooperation with the district engineers has first made O-D surveys. From these data location plans for urban route connection have been developed under a painstaking procedure which brings all local interest into the picture. As soon as a location plan is given full local approval, it is then put up for adoption in the state legislature, after which all future state highway funds available for urban work must be concentrated on the locations selected. Limited access construction will be utilized where justified.

Minneapolis - St. Paul. Greatest progress made to date is on the important East-West route, U. S. 12, through the Twin Cities, although no over-all area plan has been agreed upon. Hudson Road project, 1.1 miles divided roadway with overpasses, under construction for $1,500,000, including right-of-way. Another short section plus 1-mile widening project under construction, and studies under way for divided highway extension to edge of St. Paul business district. Also progress made on plans for $3½ million, 1.13-mile project in south

(*Continued on page* 86)



★ One of the portable gravel plants recently purchased by Kent County. This is a Cedar Rapids Jr. Tandem, 3/4-yd. truck-mounted Lorain shovel. Whole outfit rolls from pit to pit on rubber tires

County Graveling and Black Topping Program for

"Orphan" Streets

Outlying suburban streets and how Kent County, Michigan, cooperates with townships to stabilize them at low cost. Also other notes on typical road problems and activities of a populous Michigan county

By Otto S. Hess
Engineer-Manager, Kent County Road Commission, Grand Rapids, Michigan

WHEN a city spills over its corporation line, one common result is the development of scattered unincorporated communities and neighborhoods on the fringe. This has occurred during and since the war years around Grand Rapids, and many miles of streets cut through by subdividers are today not part of any incorporated city or village, yet are lined with homes. Their improvement and maintenance normally would fall to the township officials. In our county a satisfactory arrangement all around has been worked out, whereby the township bears the heavy end of the financing and the county road commission's forces perform the construction and maintenance work approximately at cost.

Two Design Standards

The general procedure, which has been followed on some 150 street and road parcels during the past year, is to grade the streets to one of two standards, depending on the funds available or expenditure warranted. For more important streets this means grading down to a permanent grade line, in anticipation of placing about 6 in. depth of processed gravel and a triple bituminous seal. Proper grading is essential, in that it enables builders of new homes to know just what street level to which they may grade their lots. Also water, sewer and other utilities can be installed later without tearing up the road and beginning over.

The 6 in. depth of compacted gravel is placed to a width of about 21 ft., this thickness being obtained by use of a pneumatic roller when screened and crushed gravel is used, or with an open grid type roller (Beach) when bank gravel is used. Then the triple surface treatment is applied, consisting of a light tar prime using .3 gal. per sq. yd. of T2 or RT3, and two seal coats of .3 gal. and .15 gal. per sq. yd. respectively of RT9 or MC5.

★ Otto S. Hess, veteran county engineer

Cheaper Type Job

The improvement includes the installation of leaching basins in the ditch line, designed to serve until such time as a storm drain system may be installed. These devices are made feasible by the sandy soil of the area. They consist of catch basins about 6 ft. in diameter and 6 ft. deep, constructed with open spaces between the bricks and without a bottom floor. Over a thousand leaching basins have been built along outlying streets to date, and they are generally quite satisfactory, although a few have failed to function satisfactorily due to clogging.

Streets thus graded, surfaced and drained have cost about $20,000 per mile at current prices.

For less important or less built-up streets where property owners demand improvement, we've developed an $8,000 per mile program. This con-

STEP BY STEP:

Kent County's low-cost method of improving outlying unincorporated streets with crushed gravel and triple seal

1 Motor grader begins on existing street, scraping loose material, dirt and sod to the edges. Operator forms a shallow trench of uniform width (21 ft.) and crown

2 Here the base is prepared full width to receive new gravel.

Old gravel is thin and lacking in uniformity. Sub-base consists of sandy loam

3 Placing crushed and screened gravel of ¾-in. max. size, to full width of trench for 4-in. compacted thickness. Truck drivers do skillful spreading job

sists of grading to a compromise grade, or, if the existing road is fairly satisfactory, leaving the profile as it is; followed by 4 in. depth of compacted gravel and a double or triple seal. The usual black-topping consists of a .3 gal. tar prime coat and a .3 gal. tar or asphalt second course, with 25 to 30 lb. pea gravel rolled in, then a fog coat of .15 gal. T9 or MC5, covered with 5 to 10 lb. of clean sand which is traffic compacted. This last fog coat is considered advisable for waterproofing although sometimes omitted to keep initial cost down.

During 1948, the County's program of surface treating roads and streets of all classifications required over 100,000 gal. of MC5 asphalt and 200,000 gal. of tar. Tar is always used for the first coat, and either tar or asphalt for succeeding coats, depending somewhat on deliveries and quoted prices.

The 4-in. stabilization is less durable than most township officials realize until acquainted with the work, and our disposition is to recommend 6-in. stabilization more frequently, as offering more service for the money with less repairs and replacements in the long run.

Gravel and stabilization work is done mostly with township funds, derived from Michigan's 3% sales tax. The county bills the townships for the cost of work performed for them. One township of the 24 townships in the county, Wyoming twp., alone has put about $100,000 annually into road work, and has over 100 miles of platted streets which take a goodly share of the funds.

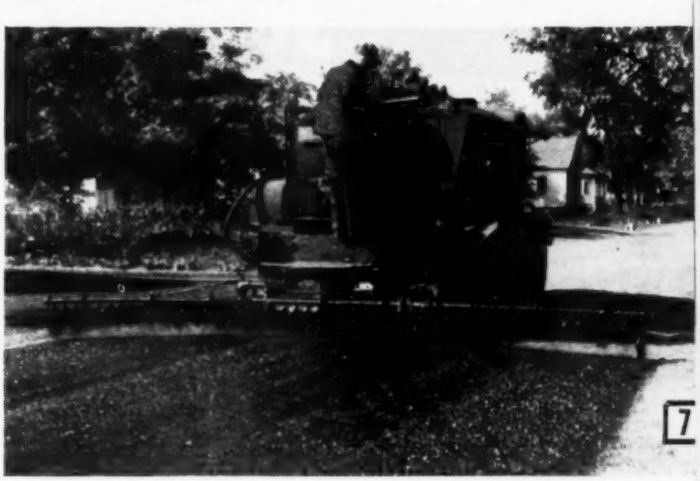
Modern Gravel Equipment

The Kent county road commission, after purchasing processed gravel from contractors for many years, recently installed two plants of its own in an effort to assure itself of a sufficient volume of materials when and where needed and at satisfactory prices. During 1947, contract prices for crushed gravel climbed to around 90 cents per cubic yard delivered in the stockpile.

In December, 1947, the county installed a new portable crushing and screening plant (Cedar Rapids Junior Tandem). The assembly included a 10 x 24 jaw crusher. A second outfit of the same model except with a 10 x 36 jaw crusher was added in July, 1948, the second unit being equipped with the larger jaws in order better to handle pit run material which runs heavily to small boulders. The former unit has proved satisfactory in pits that run more to fines. The two units combined have been able to produce around 1300 cu. yd. or more of crushed and screened ¾-in. minus material per 8 hours actual operation. The two machines have been moved about once a week during the working season, on the average. Total production for the year was about 150,000 cu. yd.

Moving from pit to pit is easy with the new rubber-tired equipment, the job consisting merely of taking up the jacks, hooking the outfit to a snow

★ Typical of the outlying streets near Grand Rapids, this one was graded, drained and surfaced by county forces with cost charged to the township. Six-inch compacted gravel, triple seal



4 Under-body blade is used to smooth up the new gravel preparatory to rolling. This operation goes on concurrently with rolling

5 The rolling job is done with a pneumatic tired unit drawn by a small tractor. This type of equipment will compact a 4-in. layer without other rolling

6 Throughout the compaction operation the foreman watches the moisture content in the gravel. Sprinkler used to keep gravel near optimum

7 Prime treatment of RT-3 is then applied at rate of .3 gal. per sq. yd. No cover material used except a little blotting sand

truck, and hitting the road. Moving time consumes from one-half day to a full day, depending on the distance of travel and other circumstances. The maximum moving distance is about 30 miles.

In figuring our gravel production costs we allow 15 cents per cubic yard usually as payment to the farmer. Production costs from pit to pit have varied between 35 and 45 cents, pits requiring a large percentage of crushing (say about 75%), of course, having highest costs. During 1948 material was delivered and tailgated on township streets for a flat rate of 60 cents per yard to the township, plus cost of haul, giving them a good heaped load for their money. These costs are based on a rental of $8.81 per hour for the plant equipment in each pit, including gas, oil and repairs, as set by the state; $4.90 for the ¾-yd. shovel or dragline used in loading into the crusher; portal-to-portal pay of 9 hours for the crew, but not including administration or overhead. All crushed gravel is graded to ¾-in. max. The crew consists of three men for each pit—a foreman, shovel runner and plant operator—and, of course, the truck drivers.

Sand Production Data

Part of the year we must concentrate on sand production. Sand base construction is used at spots where history notes indicate bad frost break-up conditions. A 12-in. blanket of sand base under a 6-in. gravel roadbed has proved to be almost perfect insurance against frost damage. Sand is also needed for seal cover, and for sanding operations in winter.

Sand costs include 5 cents per cu. yd. for the farmer, 20-25 cents to load trucks, and 10 cents per yard-mile for hauling. Loading is done with power shovel, dragline or various loaders. Although pits can't be worked in frost, sand hauling for ice control is done late in the autumn after gravel production ends.

General Notes

The road-saving value of plenty of sand under the surface, plus consistent application of sound principles in the whole field of stabilization and black topping, has helped us build up a network of more than 400 miles of bituminous roads with not a single mile "lost" during the 28 years of my work in Kent county's service. This can be credited largely to alertness and teamwork on the part of our loyal workers.

The 1948 program of $700,000 for construction and betterments makes Kent county's road program a sizable one indeed. This past year, as in previous years, some additions were made to Federal-aid primary and secondary modernization. Contracts are let for new construction on county roads as a general policy.

For surface treatment we have a black top superintendent who has his own patching and treatment organization. Extensive fog coating (about .15-gal. application) is part of our practice as a means of slowing deterioration of black top roads. His outfit includes about 12 men, 2 distributors, trucks, pick-ups, a loader, a roller, and storage tanks for bituminous material at the headquarters garage on the edge of Grand Rapids. These tanks have a total capacity of 45,000 gallons. Five outlying garages, also in the picture on road repairs, save dead-haul equipment mileage. We are putting in 1200-gal. gasoline storage tanks at each garage, and will establish regular tank-truck delivery for them during the season. In addition, a 20,000-gal. tank at the headquarters garage, heretofore used for

More tons per day
More hours of trouble-free operation
More profits
} **and Lower Costs**

PORTABLE CRUSHING and SCREENING PLANTS

The Cedarapids Master Tandem—master of aggregate producing jobs. Put a portable primary ahead of it and you have a complete quarry plant ready to do double duty for you. Operators report 150 tons an hour average production.

A Unitized Plant set up almost in the middle of an Oregon forest, typifies the portability and adaptability of Cedarapids equipment. Take it where you need it and put it to work in a hurry. Capacities of 250 tons per hour . . . and more . . . to meet any specifications.

OPERATORS everywhere report they are getting larger volume production, greater flexibility and more hours of trouble-free operation with Cedarapids portable crushing and screening plants.

The installations shown are typical of Cedarapids equipment everywhere. With their large capacity and wide product diversification, they turn out better products at lower cost with very low maintenance. These plants are made up of Cedarapids matched crushers, screens and conveyors — balanced and coordinated for the most efficient operation. They are built in sizes and types to fit every product requirement, so regardless of the size of the job, you'll make more profit per ton with Cedarapids equipment.

One of the most popular of the Cedarapids line is the Junior Tandem with many contractors telling of production of more than 110 tons per hour, crushing to ⅜" with 75% of the material needing reduction. Big capacity and low cost at its best.

In Wisconsin, a Cedarapids Pitmaster produces aggregates for secondary roads—There's lots of crushing capacity in the 10" x 16" jaw crusher and 16" x 16" roll crusher. Cedarapids horizontal vibrating screen assures the accurate grading required today.

Cedarapids
Built by IOWA

The IOWA LINE *of Material Handling Equipment Includes:*

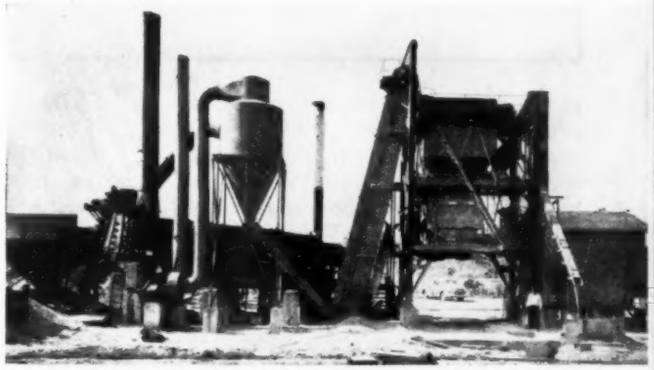
ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS – STEEL BINS • BUCKET ELEVATORS • VIBRATOR AND REVOLVING SCREENS • STRAIGHT LINE ROCK AND GRAVEL PLANTS • FEEDERS – TRAPS • PORTABLE POWER CONVEYORS • PORTABLE STONE PLANTS • PORTABLE GRAVEL PLANTS • REDUCTION CRUSHERS • BATCH TYPE ASPHALT PLANTS • HAMMERMILLS • DRAG SCRAPER TANKS • WASHING PLANTS • SOIL COMPACTION UNITS • STEEL TRUCKS AND TRAILERS • KUBIT IMPACT BREAKERS • *See Your Cedarapids Distributor For Full Details*

with Cedarapids Equipment!

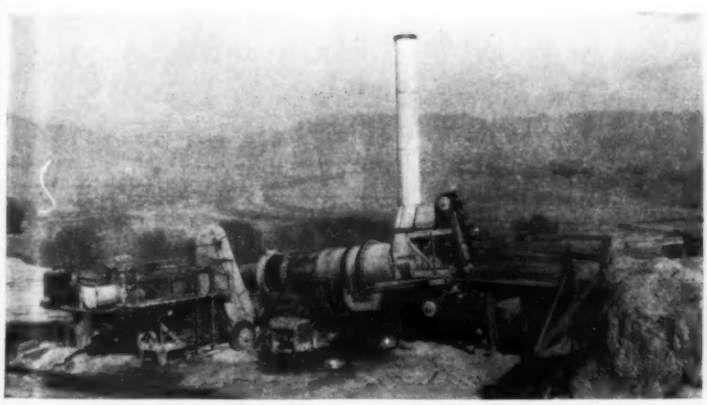
BITUMINOUS MIXING PLANTS

300 to 400 tons per day of thoroughly mixed bituminous material is the average of this Cedarapids Model "FA" super-portable batch-type plant. With drier and dust collector, you can meet the most exacting specifications.

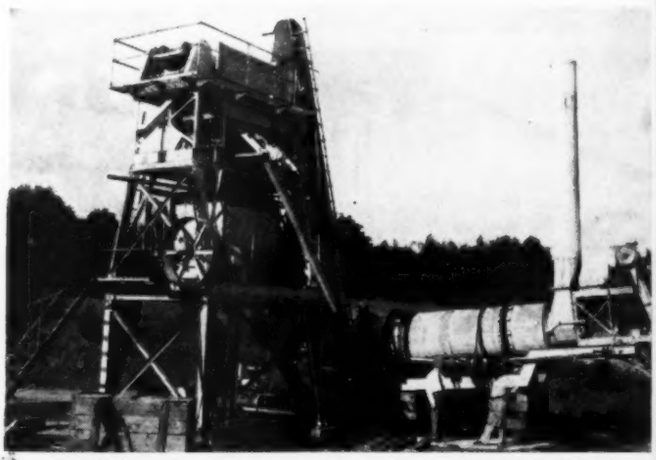
THESE bituminous mixing plants are typical of Cedarapids plants everywhere... producing a constant flow of a variety of bituminous mixes for building dependable, all-weather roads and streets. Each feature is built for simplicity of operation, maximum efficiency and easy portability. They'll deliver more tons per hour and they'll not only do it better, but at a lower cost. Made up of matched screens, pugmills, elevators and other component parts, Cedarapids Bituminous Mixing Plants produce thoroughly mixed materials, with each particle of aggregate completely coated with bitumens. When buying bituminous mixing plants, buy the best. Buy Cedarapids — a complete line of batch-type and volumetric-type mixing plants.



Cedarapids Model "E" with dust collector in Pennsylvania produces large volume of accurately batched and thoroughly mixed black top for roads and airports at remarkably low cost, and it's portable, too.



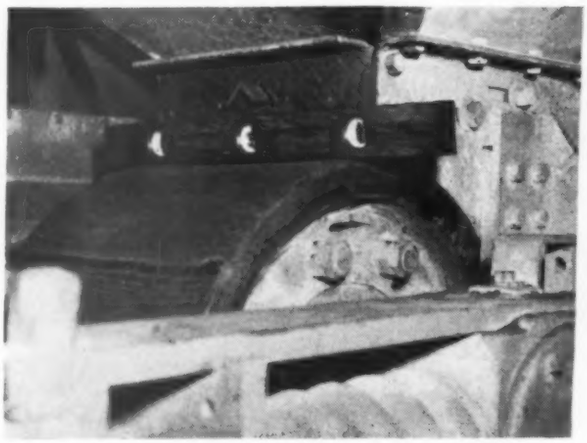
20 to 30 tons per day of patching material is the job for a Cedarapids Patchmaster. It's a real low cost, lightweight, profit maker that you can use as portable or stationary continuous-mix plant. The Master Mixer—also a continuous mix type — has a capacity of 100 to 150 tons per hour.



In Alabama, one of the newest Cedarapids 1,000 lb. Model "A" batch-type plant turns out 75 to 100 tons per day. Here's a plant you can set up quickly for all your medium-sized jobs.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.



Hard-Facing Crusher Rolls in Kent County

★ Hardfacing crusher rolls in the Kent county highway shop. At left, note worn roll partly built up with beads of hardfacing material deposited transversely in accordance with recommended practice. Roll was installed and run for a couple of weeks, then additional material placed during lull in pit work. Hard-facing of worn crusher rolls, and also such parts as elevator bucket lips, crusher jaws, gyratory mantles, swing hammers and sizing screens, is growing in practice. It is an economical means of maintaining crusher efficiency and accuracy of output, and it cuts replacement cost.

In the case of crusher rolls, as pictured, manufacturers of hardfacing materials recommend building up worn surfaces to within ⅜ in. of original diameter with proper type rod (manganese or high carbon), then hardfacing with the proper materials, laying beads transversely in skipwelding sequence to avoid overheating

gasoline, has been taken over for tar prime storage. The 45,000 gal. of headquarters tank capacity already includes a 3-compartment, 25,000-gal. half-submerged storage system for bituminous materials. Triple surface treatment work has averaged about $3,000 a mile lately.

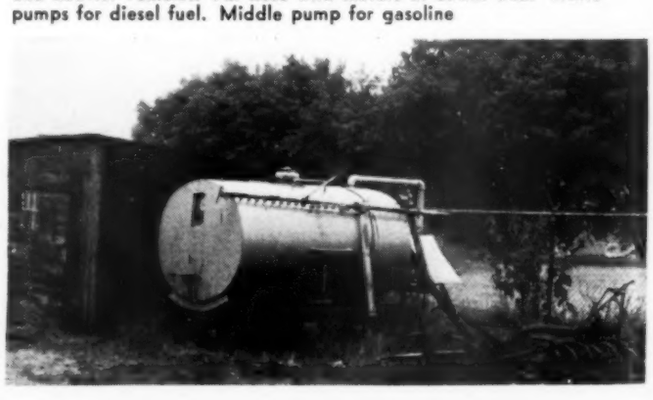
Dust Laying Chlorides

A separate operation is the dust laying program. Secondary county roads are now extensively graveled, and dust laying is necessary until they can be given surface treatment. During summer we apply both liquid and flake calcium chloride, working out of the six maintenance districts. Chloride liquid is transported from the chemical plant and stored at headquarters. Distribution on the road is done with maintenance trucks, in the beds of which 2,000-gal. tanks are set and attached to demountable spray

★ Kent county recently added this 40 x 120 ft. Army-surplus steel building (Butler) to its headquarters facilities. Used for miscellaneous storage. Doors at either end a handy feature; trucks can pass through

★ 20,000-gal. tank at the county's headquarters yard. Previously used for gasoline storage, it was changed to tar storage since this photo was taken

★ Off season, this 2,000-gal. chloride tank sets in the shop yard, relieving truck for other duty. One such for each maintenance district. During the dust laying season it reposes in the bed of a heavy maintenance truck and supplies a spray bar



★ Time-saving refueling station for the county's cars, pick-ups and heavier vehicles. Air hose with meters at either end. White pumps for diesel fuel. Middle pump for gasoline

It's easy to spot a winner

Take these two young "experts". They've spotted one in the 15-B dragshovel. The way it consistently makes smooth, big-load passes is one of the reasons why the 15-B is tops in the ½-yard class.

And if the youngsters follow the machine around, they'll see plenty of other reasons too . . . substantial performance reasons like quick convertibility to other front ends, outstanding output with any front end, and low maintenance requirements.

So take a tip from the "tots" — look into Bucyrus-Eries. You'll find they're your best buy for substained high production in dirt or in rock.

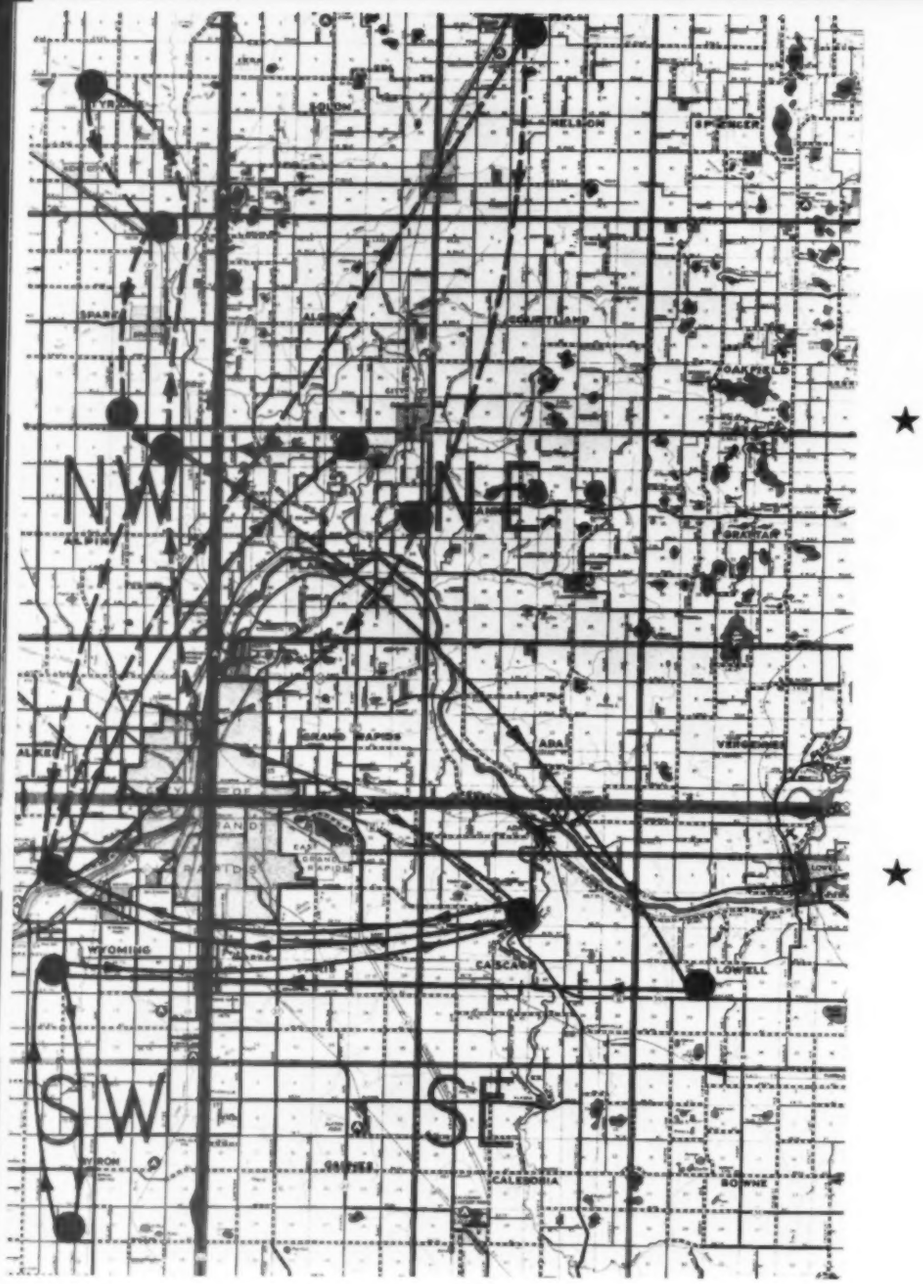
BUCYRUS ERIE

The BEST buy Bucyrus, the best BUY in excavators

Bucyrus-Erie Company

South Milwaukee, Wisconsin

134E48



★ One season's pit-to-pit jumps for Kent County's two mobile gravel plants

bars. These tanks are lifted off in the autumn and stored in the headquarters yard, freeing the trucks for other work (see photo). We are currently adding to our chloride storage capacity.

The county road forces have had an increasing demand for services of various kinds, including the township street cooperation. Some tasks have had to be curtailed in order to finance needed new equipment and increase our mechanization generally. During the 1948 season, in addition to the new gravel plant equipment, we purchased three new motor graders, two new shovels, a Gradall, an Elgin Eductor, plus numerous other items, totaling some $180,000 in all. The county needs new trucks, but these purchases will have to be spread out.

★ A recently modernized federal-aid secondary road in Kent county, built by contract. Note high profile and wide ditches, which help keep road wind-swept during snow storms. Ditch is sodded up to shoulder line on inner side and about three feet up outer side; remainder of slope seeded and straw-mulched

Snow and Ice Control

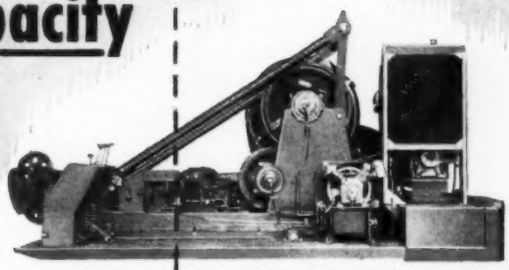
"Recommended Practice for Snow Removal"; and "Treatment of Icy Pavements Current Road Problems", No. 9-2R (Second Revision). The Highway Research Board, Washington, D.C., announces these two bulletins. Their purpose is to disseminate in practical form the best current information on those phases of highway work that are still developing. These reports are not intended to reflect average prevailing practice but rather to recommend practice based on the best current knowledge.

Since the publication in Dec., 1947, of the first revision of the original wartime Road Problems Bulletin No. 9, Recommended Practice for Treatment of Icy Pavements, the Committee has studied the prevailing practices in removal of snow. This revision presents recommendations for organizational personnel, training program, drift control, markers for drainage and structures, drainage facilities, plan of operation, use of weather reports, night patrols, public warnings, types of equipment, lighting and color scheme of equipment, dispatching of equipment, control, plowing, and for reports on snow removal. The section on ice removal is modified slightly from that given in the Dec., 1947, edition.

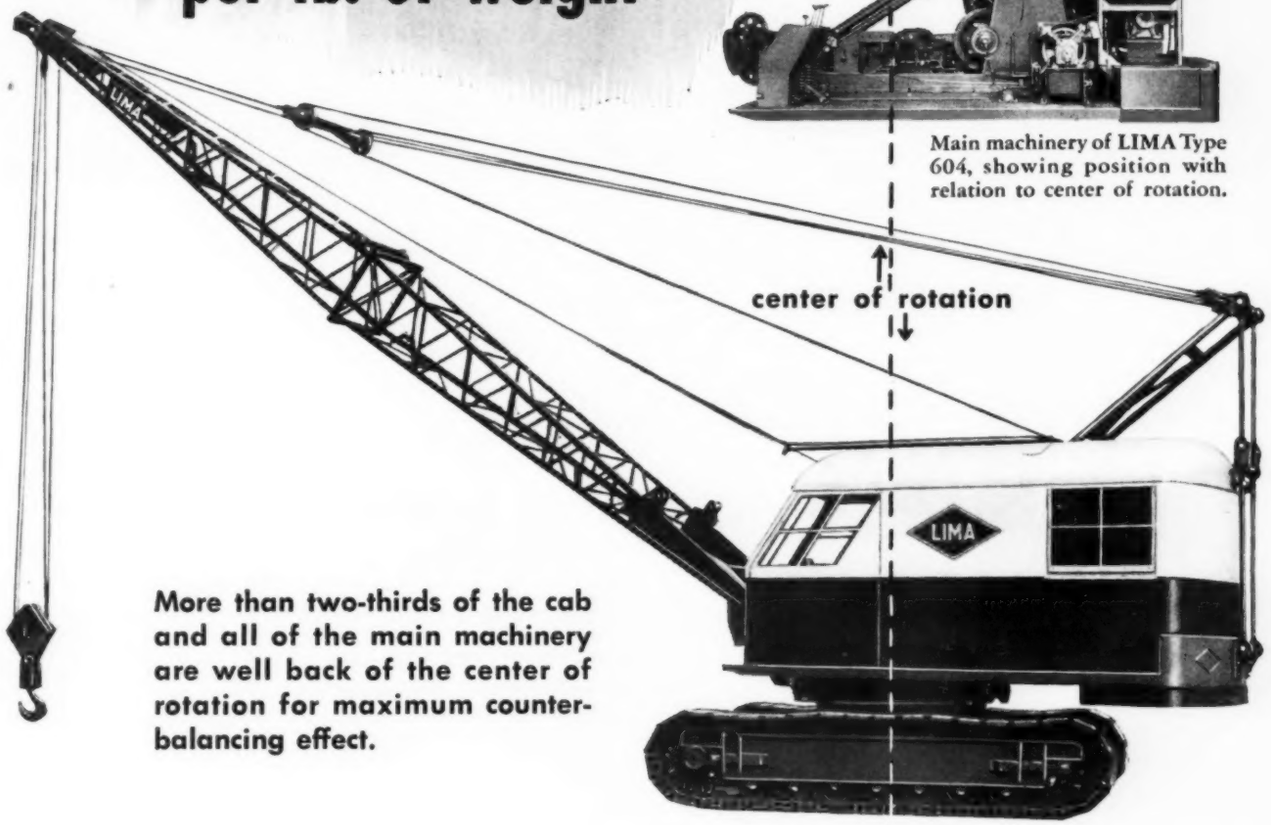
Clearing House Section Outstanding Used Equipment Values

Over one hundred individual advertisers feature an exceptionally large selection of used equipment in the 11-page "Clearing House" section which starts in this issue on page 105. Readers will find the "Clearing House" a dependable and informative directory of outstanding values in used equipment and we suggest that you make perusal of these pages a regular habit each month. At any time that you have equipment you wish to sell, anywhere in the country, we suggest that you present your offerings in our "Clearing House." This section is growing faster, getting larger every month, because it's doing a better, quicker selling job—at one low cost!

Why the LIMA Type 604 develops the greatest capacity per lb. of weight



Main machinery of LIMA Type 604, showing position with relation to center of rotation.



More than two-thirds of the cab and all of the main machinery are well back of the center of rotation for maximum counterbalancing effect.

● The LIMA Type 604 shovel, crane and dragline is engineered to produce greatest capacity with minimum weight. This is achieved by placing as much weight as possible *behind* the center of rotation—eliminating the need for excessive counterweight. Hook rollers on which the machinery base revolves eliminate strain from the center pintle—permitting continuous, safe operation at full capacity.

The simple, compact design of the main machinery, using the fewest number of shafts to accomplish the various operations, further contributes to efficient, trouble-free service.

These are only a few of the features which make the LIMA 604 a favorite with owners and operators. The Lima Line includes shovels ¾ to 6 yards, Cranes 13 to 110 tons and Draglines variable.

It will pay you to consult your nearest Lima Sales Office or representative before you buy your next shovel, crane or dragline. Offices in principal U.S. cities.

Lima Shovel and Crane Division

LIMA, OHIO

OTHER DIVISIONS: *Lima Locomotive Works Division; Niles Tool Works Co.; Hooven, Owens, Rentschler Co.*

LIMA HAMILTON CORPORATION

★ Associated Equipment Distributors' officers for 1949. Standing, left to right, are C. F. Halladay, executive vice-president and director (reg. 10); E. J. Crosby, treasurer; W. W. Bucher, president; J. A. Benson, vice-president and director (reg. 10). Seated are D. G. Macpherson, vice-president and director (reg. 15); R. L. Arnold, vice-president and director (reg. 14); and F. G. Knight, executive secretary

Equipment Men

Foresee Good Year but Keener Competition

1700 AED distributors' and manufacturers' representatives attend record-breaking meeting to discuss industry problems, "Double cream off of bottle" but little drop in volume of machinery sales expected as seven-year sellers' market period ends

ASSOCIATED Equipment Distributors began their fourth decade of service to the construction equipment industry with a record breaking attendance at their Annual Meeting, held in Chicago, January 16-20. More than 1,700 representatives of manufacturers and distributors of construction equipment attended the 5-day convention.

William W. Bucher of R. E. Brooks Co., New York, was elected president, succeeding A. F. Garlinghouse, Los Angeles. C. F. Halladay, Sioux Falls, S. D., was elected executive vice-president. R. L. Arnold, Salt Lake City, and J. A. Benson, Houston, Texas, were reelected vice-presidents and Douglas G. Macpherson of Montreal a new vice-president. E. J. Crosby, Boston, Massachusetts, is the new treasurer.

Buyers' Market Again

A business conditions survey released in conjunction with the meeting showed a majority of distributors expect a leveling, if not drop in sales volume and lower profits, in 1949. The survey also confirmed the return of a buyers' market in construction equipment. Keen competition, higher selling and promotional expenses, and high taxes are expected to hold profits down during 1949. Manufacturers who were queried during the convention estimated about a 10% drop in volume in 1949, with the fall-off mostly in the last six months of the year.

Selling conditions in the construction equipment industry, according to Mr. Garlinghouse, have undergone a sweeping change during the past year. Without doubt, the most important development has been the gradual transition from a seller's to a buyer's market. A spurt in fourth-quarter deliveries completed the change, and today sales are coming the hard way. Many distributors feel that substantial numbers of buyers have been priced out of the market.

Distributors listed a steady slowdown in collections and the tightening of credit on the part of banks and finance companies as among the most significant events of the year. Both trends accelerated in the fourth quarter under impact of the November elections. Compared to a year ago, collections are called only "fair."

Distributors also report that the pre-election optimism of business men has given way to uncertainty and a tendency to "wait and see." This attitude is reflected particularly in the deferment of industrial construction plans in more than a few instances.

Generally in 1948 distributors have prospered. They chalked up a better sales record than in 1947 when an estimated $1 billion of equipment was sold. While total expenditures on new construction exceeded $17 billion in 1948—up 26% from the previous year—distributors' sales showed a much smaller increase.

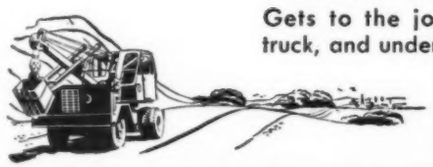
Distributors expect to encounter pressure for more trade-ins and more rental purchase options this year. Most distributors estimate the number of trade-ins are up 50% over a year ago. Increases range from 25 to 100%, varying widely according to area and individual company. Buyers are asking excessive allowances on old equipment, much of which was purchased second-hand at inflated prices, distributors say.

Well Balanced Inventories

Year-end inventories are up from a year ago but are better balanced. Opinion is about equally divided as to whether inventories are too large or large but not in relation to volume of business. Higher overhead costs and tighter credit, and the plentiful supply of equipment are prompting most distributors to watch inventories carefully.

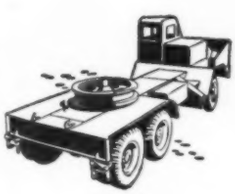
"Because I figured competition's bound to get tougher. I wanted a shovel that could cover lots of ground and make better money on all kinds of jobs. Take it from *me*, if you want to get the most for your money, get a MICHIGAN!

"IT'S FAST ON THE ROAD—
Gets to the job as fast as a truck, and under its own power.



"IT MOVES DIRT FAST—
Anyway you look at it, it's *yardage* that counts. MICHIGAN'S 5.4 RPM swing and fast air clutches give you the extra yards a day you're after.

"IT'S *REALLY* BUILT—
Any time you put a shovel on a truck you need a chassis that's designed for the job. And MICHIGAN *knows how*—they've built their own chassis for years.



"IT'S EASY TO HANDLE—
You know that if a machine is rough on the operator he'll probably be rough on the machine. MICHIGAN'S air ram clutches are fast and easy. They take the work out of operating. That's why my operators like to run the MICHIGAN."

See MICHIGAN Truck Shovels at work on jobs like yours — write for Bulletin 100, "On The Job with MICHIGAN."

MICHIGAN

MICHIGAN POWER SHOVEL COMPANY, 480 Second Street, Benton Harbor, Michigan

AED Regional Directors for 1949

JOHN B. PERKINS, general partner of Perkins-Eaton Machinery Co., Boston.

W. W. BUCHER, president of R. E. Brooks Company, New York.

S. JOHN OECHSLE, president of Metalweld, Inc., Philadelphia.

HARRY TEAL, president of Highway Machinery & Supply Co., Richmond, Va.

E. B. WILKINSON, vice-president and general manager Wilson-Weesner & Wilkinson Co., Knoxville, Tenn.

J. WALKER WILSON, of J. Walker Wilson Machinery Co., Youngstown, Ohio.

GEORGE E. HILLSMAN, president of Hillsman Equipment, Chicago.

C. G. HALLADAY, president of Halladay-Dettman Co., Sioux Falls, S.D.

A. C. ANDERSON, president of Anderson Equipment Co., Omaha.

JEWEL A. BENSON, president of Benson Tractor Co., Houston.

JACK HOW, general manager and partner of Edward R. Bacon Co. and vice-president of Western Machinery Co., San Francisco.

WILLIAM H. BOOTH, vice-president of Clyde Equipment Co., Seattle.

W. L. PARNELL, president of Construction Machinery Co., Shreveport, La.

R. L. ARNOLD, president of Arnold Machinery Co. and Tractor-Implement, Inc., Salt Lake City.

DOUGLAS G. MACPHERSON, president of Watson Jack & Co., Ltd. Montreal, Canada.

While distributors' attention is naturally focused on conditions which may be unfavorable, Mr. Garlinghouse pointed out that they are by no means sitting idly by. Customers can expect more and better service from distributors and dealers. Advertising will be used more extensively. More attractive credit terms will be sought and time payment plans may be revived. Progressive distributors are placing a premium on management efficiency. Business sessions of the meeting consisted largely of clinics and panel discussions devoted to the operation of a distributor's business and manufacturer-distributor relations.

A special local association clinic was held on Sunday, January 16, to discuss the organization, operation and services which local associations render. Also discussed were methods of cooperation between local groups and state universities in presenting educational programs and in sponsoring state or regional road shows.

Greater Cooperation Urged

Biggest attendance was registered at the panels on manufacturer-distributor relations and "Take Home Pay for the Boss." The former dealt with a selected group of problems which occur most frequently in manufacturer-distributor contacts. Subjects discussed at the latter included finance and insurance, credits, collections and tax problems, salesmen's compensation and the inspection of new equipment.

Plans to expand Association services which assist members in the conduct of their businesses were announced, and a special committee has been appointed to study the needs of members.

Mr. Garlinghouse, in his annual message, called for increased cooperation between manufacturers and distributors. A variety of activities toward this end has been in progress the past year with notable results, and Mr. Garlinghouse urged further cooperation as the means to mutual prosperity.

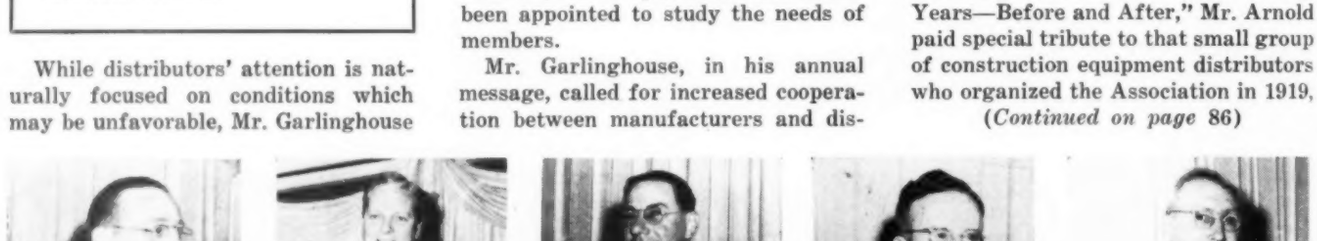
One full day, Tuesday, January 18, was devoted to individual contacts between manufacturers and distributors.

Entertainment highlights included an "Early Bird's Breakfast" in honor of Mr. Garlinghouse, sponsored by A.E.D. members from Southern California, a President's Cocktail Party, Annual Banquet, Installation Luncheon for new officers and directors, a luncheon in honor of new members, and a closing luncheon sponsored by manufacturers. Feature luncheon speakers were Gene Flack, sales counsel and director of advertising of Sunshine Biscuits, Inc., New York, and William H. Upson, noted humorist and author of the popular Alexander Botts—Earthworm Tractor series in the Saturday Evening Post.

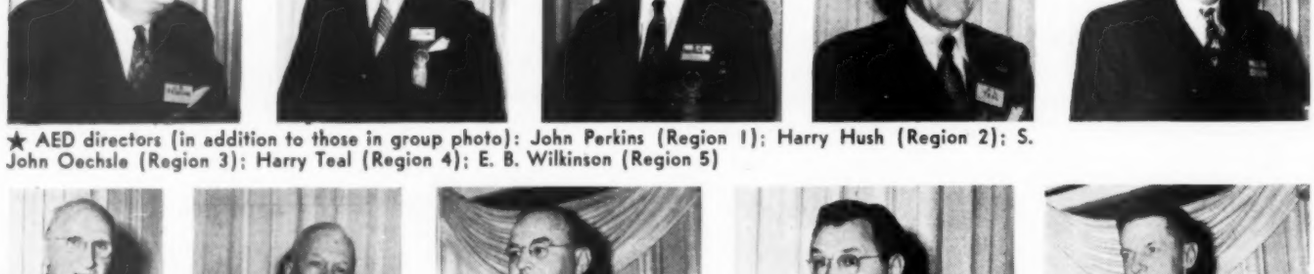
This was the 30th Annual Meeting of the Association. Tribute was paid by A.E.D. Vice President R. L. Arnold of Arnold Machinery Co., Salt Lake City, to those who have actively promoted the Association's growth to the present record membership of 1,024 members from the United States and Canada. He declared it would be difficult to match the record of progress made by the Association during the past thirty years, but expressed confidence it would be done by working together under sound leadership.

In his address, entitled "Thirty Years—Before and After," Mr. Arnold paid special tribute to that small group of construction equipment distributors who organized the Association in 1919,

(*Continued on page* 86)



★ AED directors (in addition to those in group photo): John Perkins (Region 1); Harry Hush (Region 2); S. John Oechsle (Region 3); Harry Teal (Region 4); E. B. Wilkinson (Region 5)



★ More AED directors: J. Walker Wilson (Region 6); George Hillsman (Region 7); A. C. Anderson (Region 9); Jack How (Region 11); W. L. Parnell (Region 13)

SEAMAN Pulvi-Mixer Builds a More Durable... More Stable... Macadam Base!

Mixing-in fines with crushed rock at Orchard Field Airport, Chicago, Ill. to eliminate stratification and segregation of aggregate.

The Seaman leaves a loose, level surface ready for immediate compaction. Note smooth surface left by roller which immediately followed the previous pass of the Seaman.

Mixing fine slag and 4" crushed slag to form a durable, stable base ready for immediate compaction on this Pennsylvania road. Tough going in 4" slag but the Seaman is built for heavy-duty service. Selective speed transmission adapts rotor speed to job requirements.

SEND FOR THIS FREE BOOKLET "Macadam Base Construction Methods" contains the latest information, descriptions, methods and procedures for Macadam base construction. Ask for Bulletin No. 60.

Modern Macadam is Pulvi-Mixed

A road is no better than its base. That is why more and more modern Macadam base roads are being built with Seaman Pulvi-Mixers . . . to assure uniform depth and blend of the aggregate, prevent the segregation and stratification of materials, and provide a more stable, more durable base. The Seaman Pulvi-Mixer leaves a thoroughly blended, homogeneous texture ready for immediate compaction.

Where fines are employed as binder, the Seaman disperses them thoroughly, from top to bottom, filling the voids and assuring a more positive keying and locking of the aggregate. At the same time it leaves sufficient fines level with the surface, for smooth rolling and compaction. It also saves hundreds of man hours per mile by eliminating the slow, costly "hand brushing-in" of the fines.

Seaman Pulvi-Mixers are equally effective in the mixing-in-place of crushed stone, slag, chats, gravel, etc., with water, tar, asphalt, Portland cement or other binders. No matter what your job may be, a Seaman will provide a better mix for longer-lasting, low-cost road construction.

SEAMAN MOTORS, INC.

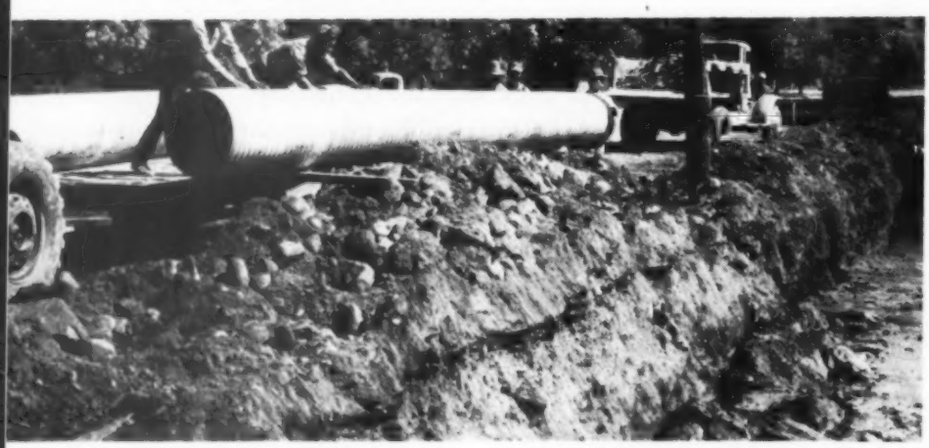
291 N. 25th STREET **MILWAUKEE, WIS.**

★ Looking along US 40 through Vernal, Utah, with trenching in progress and pipe arriving for placement. Note nice lawns and trees along this street, which is the city's main thoroughfare with business district in far distance. Street subsequently paved and given curb and gutter. 2040 lin. ft. of 24-in. corrugated metal pipe was installed

Ditch Enclosure Through Small City

Solves Double Problem of Storm Drainage and Irrigation Supply

★ One man set and bolted metal bands at joints, another watered down dry earth, while two men spaded, shoveled or tamped backfill



A TYPICAL small town drainage problem is that of disposing of storm run-off along the "highway through town." In the usual smaller community, this means first of all eliminating the unsightly, inconvenient and sometimes hazardous roadside ditch. Enclosure by means of a line of drainage pipe is a common solution. It makes possible a transition to street-type cross section, with curbs, gutters and inlets at required intervals. And such a storm drain very often serves as the beginning of a storm collection system that extends out into residential areas.

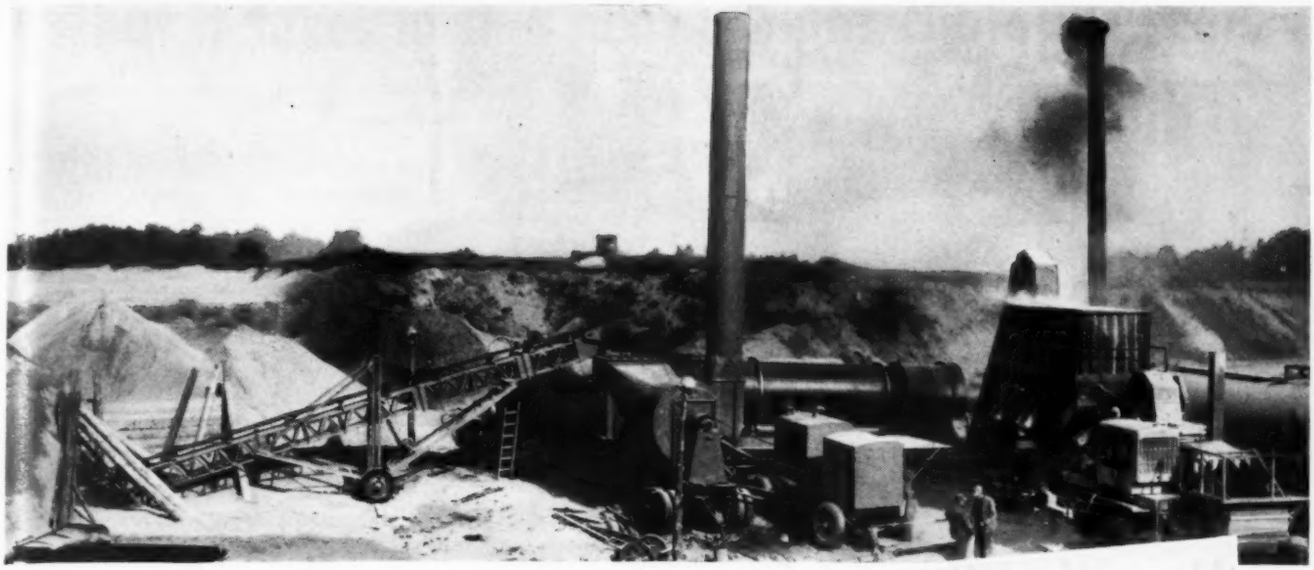
The foregoing hypothetical case fits well into the situation that existed in the small community of Vernal, Utah. Located along U.S. 40 near the Colorado border on the Salt Lake City to Denver run, this small town has grown until a ditch enclosure became necessary some time ago. The original enclosure includes wood-stave pipe which acted as part of an irrigation water distribution system for the lawns and farms of the immediate area.

During the 1948 season it became necessary to replace this old drain, which had failed and was inadequate

(*Continued on page* 104)

★ Long pipe sections were rolled off the trailer by two men

★ Surplus material and refuse was mechanically loaded and trucked to disposal site



THESE BIG ASPHALT PLANTS ARE

Going Places!

● How would you like a big asphalt plant that you can set up in a few hours . . . one in which all mixing operations are fully automatic?

Now, you can get these two important features . . . plus many more . . . in a plant that produces 100-150 tons of material an hour. It's PIONEER'S Continuous Process Asphalt Plant.

This big plant consists of only three main units, the mixer and the dryer and the dust collector. Each is a complete unit mounted on its own pneumatic tired truck. *It's the most portable large asphalt plant ever built.*

All mixing operations are fully automatic . . . fully controlled, because the asphalt metering pump and the aggregate feeder are interlocked. They are synchronized to work together. The human element in proportioning is out . . . the correct mix is assured.

If you're going after big black top jobs this year, better get full details about PIONEER'S Continuous Process Plant now. It can give you better material mixed to closer tolerances at lower cost per ton. Mail the coupon today for our new handbook.

PIONEER ENGINEERING WORKS
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BUY BOTH!
Higher Output, Lower Upkeep!

Pioneer

Continuflo **EQUIPMENT**

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● Please send me your new handbook on Pioneer Continuflo Asphalt Plants.

Name_____

Address_____

City_____ State_____

★ Road mixer and asphalt supply tank, "making hay while the sun shines" on the Outer Banks project. Note absence of side ditches, not cut until later

How We Whipped Sand and Water on the

Outer Banks Job

Talk about your troubles! The contractor and subcontractor had to walk their equipment 50 miles through the sand, ferry their stuff through shallow sounds, salvage machinery from sunken barges, fight Cape Hatteras storms, rebuild washed-out pavement —and do crazy things like cutting his ditches last. But the people of North Carolina's Outer Banks now have the beginnings of a modern road.—*Editor.*

By W. Vance Baise
State Highway Engineer of North Carolina

TO really appreciate this story one should look at a map, with a particular eye on the Atlantic coast line. One will note that the coast is very irregular bordering North Carolina—that there are large shallow sounds, and a tiny fringe of land that lies between the sound and the ocean like a barrier. This barrier is in reality a series of long irregular islands with occasional inlets, some permanent, others dry except in storms. This slender thread of land varies in width from 2000 feet to about four miles. Up and down this land, there are sev-

★ Showing Cape Hatteras area and location of the new road

★ Job's one big mishap. A barge load of machinery, sunk just offshore while on the way to the job. Stayed this way over Christmas

What it takes to stay heavyweight champ 17 years

1. Real heavy-duty truck reputation!

To haul lots of oil, you pick a he-man truck that's made for the job. You pick a truck with a record of performance that shouts "TOUGH!" You pick an International Truck.

Registration figures show that for 17 straight years Internationals have led the heavy-duty truck field.

2. Real heavy-duty power!

On construction jobs you need a truck that can take a pounding . . . a truck with a powerful engine, a rugged frame, sturdy strength through and through.

You find trucks like that at International Harvester . . . a builder of truck power for 42 years, a manufacturer who knows what tough trucks need.

3. Real heavy-duty truck engineering!

On big logging jobs you need size, brute strength and power . . . *specialized* by people who know your job in terms of trucks.

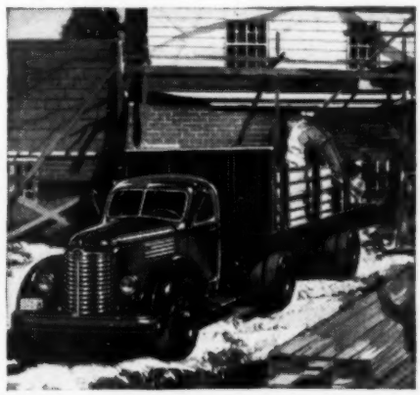
International heavy-duty trucks are big, tough, powerful—and *specialized* to handle the toughest hauling jobs. That's our engineering tradition.

5. That's why International trucks are heavyweight champs for heavy-duty jobs—

For 17 straight years, International heavy-duty trucks have been America's first choice for heavy-duty work. Registration figures prove it. In trucks having gross weight ratings over 16,000 pounds, Internationals are so far ahead of the field that the heavyweight crown carries a Triple Diamond emblem.

Right now, International Dealers and Branches can give you quick delivery on International heavy-duty trucks . . . specialized trucks, engineered and powered for your job.

Your nearest International Truck Dealer or Branch will be glad to send a qualified transportation engineer to analyze your hauling problem, to give you facts and figures on equipment to meet your specific needs, to answer any questions you may have. Call him soon.



4. Real heavy-duty truck stamina!

Housing is a big job where you measure truck toughness by years of getting the work out and keeping the costs down on all hauling operations.

You can count on years of service from International heavy-duty trucks. The nation's largest exclusive truck service organization is set up to keep Internationals operating at peak efficiency, over the long haul.

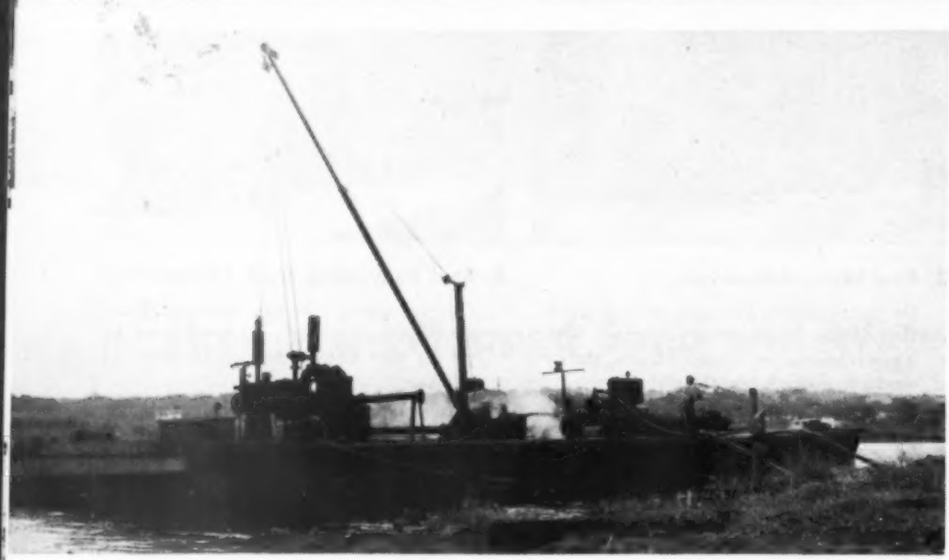
Other International Harvester Products
Farmall Tractors and Machines
Industrial Power . . . Refrigeration

Tune in James Melton and "Harvest of Stars"
CBS, Wednesday evenings

INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY · CHICAGO

★ Showing typical grading equipment and sandy conditions along the project. This section is in the relatively "high" country, upwards of 10 ft. above beach level



★ One of the barges which delivered asphalt

eral coast guard stations and small villages.

It was the desire of several governors of North Carolina to help these citizens, and for a start, it was finally decided that the villages of Avon, Buxton, and Hatteras should be linked by a road. This would enable them to build a consolidated school, a centralized hospital, and greatly enhance the communication between the villages, as well as facilitate travel to the mainland. This involved about 17.3 miles of roadway.

Heretofore, one could reach these villages by either taking a ferry at Englehard, which runs when the weather permits and crosses Pamlico Sound to Hatteras, taking several hours, or—leave the paved road below Nags Head and drive down the sand road, crossing Oregon Inlet using a free ferry operated by the state highway commission. This trip is made by those with strong backs.

Contractors Look Over Job

When the highway commission showed this job to several prospective contractors, they all spent the night at the end of the paved road, south of Nags Head. They arose before daylight and bucked the sand for 10 miles, reaching the ferry's first run. On the other side, once again they took to the sand. Sometimes flooded ruts threatened to drown out the cars. Other times the sand was so dry that they were stuck in the sand. It is about 60 miles to Hatteras where the prospective new road began. But to go there and back with scarcely an hour's stop took the party until sundown, and then they almost missed the last ferry. All of the men taking this ride agreed that the energy consumed would be equivalent to a week's travel on a paved highway.

The highway commission took bids on this work May 20, 1947, and received bids from two of the five firms who sent representatives to prospect the job. From this, one can see that the others decided the hazards were too great for an intelligent estimate of costs.

On June 3, 1947, the contract was awarded at approximately $294,000 to the Ballenger Paving Company of Greenville, S. Carolina. Principal items of construction:

41	Acres of Clearing
27	Acres of Grubbing
68,000	cu. yd.—Unclass. Excavation
39,000	cu. yd.—Borrow Excavation
1,900	lin. ft. Conc. Pipe 18" to 48"
188,300	sq. yd. 5" Sand Bituminous Surface Course (mixed in place)
687,400	gal. Cutback Asphalt (RC-2)
20	Items of Housemoving

Two hundred working days were allotted to build the job.

The type of pavement selected was obvious to anyone familiar with this country. From Station O to the end, there was plenty of sand. Gradation varied from desirable to fair. Generally it was considered good enough for a bituminous stabilized surface course, so the only material to be imported was the cutback asphalt.

How to Get Outfit in

First, the contractor had to devise ways to get pipe, cement, asphalt, and equipment into the job. Each of the villages had harbors which were reached through shallow channels from the main waterway channels in the sound. Before going further, it is well to say that shipping in the sounds is very hazardous. The sounds are shallow and the amount of water is greatly affected by the winds. In fact, during Northeast winds of only moderate intensity, all shipping must seek harbor. Further, most towing companies shun work which calls for movement of materials in the sound.

The contractor decided to ship a load of grading equipment in with a bargeload of pipe from Norfolk. While loading barges and towing them to Buxton, bad weather delayed the tugboat so that the movement took 17 days. The Ballenger firm sub-let the grading, pipe work and clearing to the E. W. Grannis Company of Fayetteville, N. Carolina. Housemoving and clearing was begun in August. Mid-September, Ballenger began to move in mixing equipment to begin paving.

★ How a storm inundated and ruined a section of completed road. Several thousand feet of roadway had to be rebuilt

Note this difference
The illustration shows you how each wire and each strand in
Preformed Wire Rope
is preshaped to the position it assumes in the finished rope. As a result, Preformed lasts longer, handles easier, is safer to use, and saves installation time.
Take advantage of the savings Preformed wire rope offers. Ask your supplier about it. Then specify Preformed wire rope on your next order.

Sidelights on Outer Banks Job

By W. Vance Baise

CONSIDERATION was given to various types of pavement, especially cement-stabilized courses, in comparison with a 5-in. road-mix of sand-asphalt. We finally decided that the latter would be most economical under the conditions.

The contractor's bid prices included 65c per cu. yd. on excavation and borrow; 43c per sq. yd. on the surface course of sand-asphalt road-mix; and 14c per gal. on the cut-back asphalt. He used 4 tractors with 12-yard scrapers and 2 heavy bulldozers for grading. One ¾-yd. shovel cut ditches and laid pipe culverts.

Ditches Built Last

The sand particles here are very round and not well graded, and for these reasons the sand has little stability. In contrast with customary roadbuilding practice, only enough grading was done to allow a pavement to be laid. Due to the unstable sand and presence of wind and water, it was decided to build shoulders and ditches after completion of the pavement. To further obviate washing and undermining when the tide went out, the grade was laid to a level corresponding exactly with the ground contour, over some 65% of the project. The grade was shaped 2 to 3 in. high to allow for compaction after mixing.

Mechanical Mixing Details

In designing the pavement we originally planned to use 3.25 gal. of RC-2 asphalt per sq. yd., later adjusted to 3.50 gal.

Mixing operations employed the following equipment: 1 large Wood road mixer; 2 large tandem Caterpillar motor graders; 2 Seaman pulvimixers; 1 asphalt heater; 1 drag harrow, 1 18-ft. disc harrow; 4 calibrated 1500-gal. supply tanks (on 6 x 6 trucks, which had to be pulled by a D-7 tractor when unloading); and 1 pneumatic roller.

On an average day 2 miles of pavement 9 ft. wide were mixed, and as soon as the mixing operations were completed full width, the pavement was then roughed out and left through the winter. As a check on asphalt content, the paver showed the number of gallons used; also the supply tanks were calibrated, and measured before and after hooking to the paver.

We also took several samples per day for extraction tests to check asphalt percentage. The mixing operations were completed in December, but no attempt was made to aerate to get the naphtha and water out of the asphalt at that time of the year. The pavement was permitted to remain undisturbed, after being roughly shaped, until the 1948 spring and warm weather.

Two coastal storms struck the project (Oct. 13 and Nov. 1, 1947) during which several miles of the unfinished road were under water. It was necessary to replace 1450 lin. ft. of pavement washed away. It is believed, however, that if the contractor had been successful in getting the pavement completed and thoroughly compacted, with the shoulders leveled out, we would have lost little if any time.

Aerating and Finishing

Work was resumed in aerating and finishing the surfacing on May 10. To complete this operation the pavement was scarified for 4 in. depth, aerated by windrowing with a motor grader and disc harrow, and then placed back in proper position. The final finish was obtained by constant machining with motor graders, and a final rolling with pneumatic rollers. The shoulders and ditch lines were then completed and the job taken over from the contractor on July 11, 1948.

The job itself was not so unusual but is interesting for the extraordinary conditions and the necessity of accomplishing the job at a low cost. With our experience with beach sand we did not expect the job to be very stable, especially during the first summer. We rather expected to apply some light-type surface treatment as a wearing surface to give it a little more stability, at least for the first summer. The job, however, has stood up unusually well under existing conditions, and it now appears it will not be necessary to place any type wearing surface on top of the road-mix-sand-asphalt surfacing in order to secure additional stability.

E. H. Baggs was resident engineer; W. B. Smoak, senior inspector, and T. J. McKim, division engineer, in charge of the project.

Transportation Woes

After the experience with the first barges, the contractor elected to move in by trailers to the end of the pavement, and then move the other equipment under its own power to the end of the job. However, this backfired. After moving all of the equipment across the Oregon Inlet Ferry, with the exception of the Wood Mixer and the D-8 Caterpillar towing tractor, the ferryman refused to move the mixer across the inlet. It was then necessary to walk the mixer and tractor 10 miles back to the pavement end and transport them to Elizabeth City, where they were loaded on a road department barge.

Next day, this equipment was unloaded at Avon. The weather became unsettled and it was ten days before the contractor could return the barge.

The contractor located two oil barges in Florida and a deal was made between the Florida Towing Company and the Contractor to transport asphalt from the Mexican Petroleum Company at Norfolk to the three villages. By using the village harbors the contractor was thus able to cut down tank-truck haul in supplying asphalt to the mixer. This was highly desirable because the 1500-gal. supply trucks could hardly pull through the sand, although they had front and rear drive. The harbor at Buxton was not as deep as the harbors at Avon and Hatteras. Consequently, the barges could not be loaded with as much asphalt when consigned to Buxton. The first barge was loaded Sept. 29 and, after considerable trouble, was tied up until a shallow draft boat owned by the Hatteras Development Company could tow the barge into harbor. At that, the barge which normally carried 120,000 gal. at full draft only carried 70,000 gal. This experience led the contractor to negotiate for additional barge service.

Difficult Terrain

The project began in the village of Hatteras and wound along the sound side, turning eastward along the beach for about 4 miles. From there for about 8 miles the location was on higher ground, more to the sound side. The road meandered through pine woods, dunes and occasional marshes, calling for muck removal and borrow, and passing thus through the village of Buxton at elevations more than 10 ft. higher than the beach. The last 5½ miles to Avon were along the beach, with the island often less than a mile wide. The clearing and grading were very light on the ends and heavy in the mid-sections.

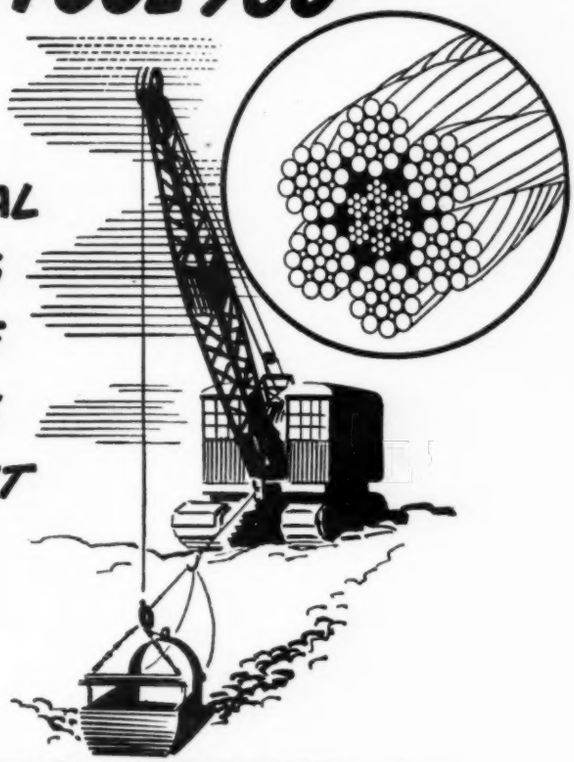
Normally, the driest season was at hand, and although the season for hurricanes was near, the contractor felt that these never lasted long. So, he elected to start mixing the end section first, largely to give his grading contractor a chance to get out of the way faster; and to accomplish the final late season mixing in the hills where the sand would be drier and work sheltered by trees. It was generally thought that the atmosphere would be several degrees warmer away from the beach.

It was decided to mix the 18-ft. roadway in two 9'3" panels, allowing for overlap and assuring full processed width. The engineers felt that if the sand were mixed to a depth of 8 in. loose, it would compact to slightly over the 5-in. minimum required.

Man vs. Elements

Actual mixing began on the Avon end Oct. 5, working toward Buxton. The first barge was emptied Oct. 7,

SOME ROPES FOOL YOU



U-W 6×16 FILLER WIRE IS IDEAL FOR DRAG CABLES ON DRAG LINE EXCAVATORS BECAUSE IT IS SUFFICIENTLY FLEXIBLE AND ABRASION RESISTANT

BUT...

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For longest and best service, always specify
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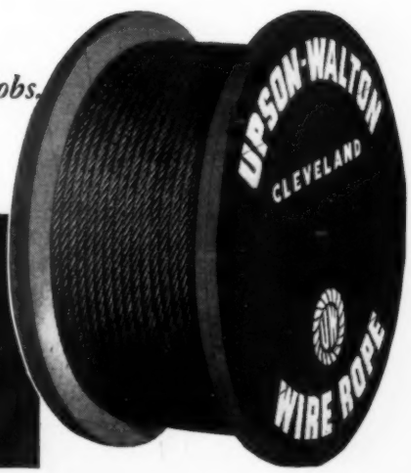

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★ More salvage scenes from the sunken barge. *Left:* Up comes a Mack truck, cab somewhat mangled in sliding off the barge as it sank. *Center:* Diver employed to help get the stuff up. *Right:* A Cleaver-Brooks booster heater on the hook; had rolled off a truck when the barge sank. Down in it, the men found a "Piggy Bank" with five bucks in it, lost from Grady Ballenger's house trailer, which also went down

★ The first machine to be hoisted out with the floating derrick—a heavy tractor, little the worse after a mechanical going over. This machine, a D8 Caterpillar, was a real load. The only place the diver could hook the sling was on its front idler. A slim safety factor, but she held

when a total of 10,500 lin. ft. had been mixed. No more asphalt was received until Oct. 10. Such delays were experienced throughout the job, usually due to weather, so that the boats were not able to bring barges in with regularity to keep up continuous operation. After emptying the second barge load on Oct. 11, the first in a series of storms hit. The seas broke across the beaches in numerous places, of course cutting the newly mixed roadbed at numerous places. During this period, rain fell in torrents and several miles of completed mix was inundated for days.

It became apparent by this time that the costly delays due to irregular asphalt delivery would throw the completion of mixing too late to enable the contractor to take advantage of the warm weather, necessary in finishing. Hence, it was decided that all energies would be concentrated on the grading and mixing and on sealing the mix material, with the idea of opening it up in the spring for final aeration and finishing.

Mixing was resumed Oct. 19. This barge-load carried material for 10,500 ft. and permitted completing the mixing of 5½ miles on the end of the job. Then, as planned, the contractor switched to the Hatteras end, still utilizing the beach sections, and giving the grading contractor more time to complete work on the 8-mile mid-section. Mixing was begun in Hatteras Oct. 27. The 4 miles on that end was mixed out on Nov. 8. A total of 7 days was lost between Oct. 21 and Nov. 8, due mostly to asphalt delivery. This was typical of the construction. The mixing continued from Oct. 4 to Dec. 15, a span of 72 days, with mixing possible on 39 of these days. Mixing progress varied from a low of 500 lin. ft. to as high as 4800 ft. per day, utilizing from 3,860 to 31,450 gal. RC-2 daily.

Toward the last of November, the mixing crew-men caught up with the grading outfit and shut down for an entire week. But they soon caught up with the grade again. From Dec. 6 to 15 the mixer ran intermittently, mixing on 4 of the 9 days, finally turning out the last 3,850 feet.

Winter Inundation

After the final roadway mixing, the contractor mixed material in a borrow pit to be used by the state for maintenance and for filling washouts. In addition, 15,000 gal. of asphalt was left in large storage tanks. After considerable thought, the highway commission staff decided that it would be best not to fill washouts until spring. They reasoned that during winter there would be a recurrence of high tides over the beaches, with chances that the sea would break through repeatedly at the same places. This proved to be a wise decision, for the sea climbed over several more times during the winter, and no more roadway was lost than before. The work was suspended just before Christmas holidays until spring.

Raising Sunken Equipment

The contractor was plagued with more bad luck in moving his mixing equipment out. They elected to use the highway commission's barge, with the idea of towing it to Englehard where heavy-duty trailers were ready to carry the equipment further inland. Two D-8's and one D-7 Caterpillar tractor were loaded on the barge at Hatteras, along with a Wood Roadmixer, a Cleaver-Brooks boiler, a Cleaver-Brooks booster-heater on a Mack truck, a mechanical broom, an I-D 6 International wheel-type tractor, a Seaman Pulvimixer, a 6-in. pump on a truck, and a house trailer. That night after crossing the sound, as the boat turned into the Englehard Channel with less than an hour's tow, the barge sank in 9 feet of water, leaving all but the largest pieces completely submerged. This was the week-end before Christmas and the contractor could get no salvage equipment or divers until Dec. 29.

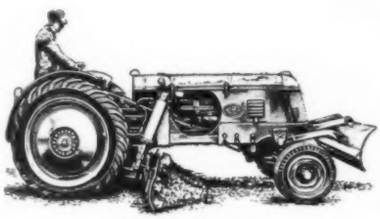
The equipment was raised by a large derrick boat and loaded on another

(*Continued on page* 84)

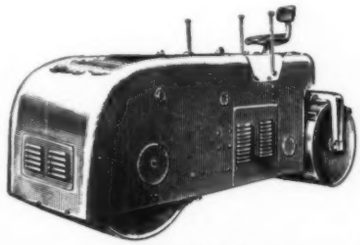
★ Leon Goodwin, grading superintendent on the project, snapped while he was overseeing the salvage work

THE NEW HUBER LINE OF 3 WHEEL ROAD ROLLERS

"Built to Do a Better Job"



THE HUBER MAINTAINER
Seven machines in one



HUBER TANDEM ROLLERS
5 Models — 3 to 14 Tons

Road men and contractors alike are setting their sights on the multimillion dollar construction program for 1949. To assure top profits throughout the year, and for years to come, smart operators are choosing Huber 3-wheel rollers for the tough compacting jobs ahead. They are known the world over for lower cost per mile performance . . . faster than average working . . . and longer life under all operating conditions. Modern in every respect the new Huber 3-wheel rollers are available in five models from 4 to 14 tons, gasoline or Diesel powered. Features include straight-line front end design . . . welded super-strength frame . . . anti-friction bearings throughout . . . heavy duty drive line with 3-speed transmission, both forward and reverse.

This year rely on the Huber line—tandem rollers . . . 3-wheel rollers . . . and maintainers to lick your compacting and maintenance problems. Write today for descriptive bulletins and name of your nearest dealer.

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Contractors select rugged Heltzel steel forms for the tough jobs. The test, above, demonstrates that Heltzel forms withstand brutal use . . . these forms will support, year after year, the heaviest subgrading and finishing equipment. At left — Heltzel forms on a Western irrigation project.
Highway
Heltzel
BUILDS IT BETTER
Airport
Heavy duty forms, engineered for the form setter . . . protected type stake pockets, hot forged steel stakes, non-clog joint locks, lock joint guides . . . for fast setting, accurate alignment and easy stripping. ASK FOR BULLETIN B-19.
Below — the famous Heltzel dual duty airport form used for Patterson Field's 24" slab.
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Ohio City Holds Down Winter Street Costs With Salt

By Arthur Meigs
Superintendent of Streets
Warren, Ohio

IN spite of the fact that snow and ice removal costs have increased considerably during the last ten years, and labor is now more expensive, we are operating on approximately the same budget that we had at that time, and are doing an even more complete job of keeping important local streets snow-free and safe than we did then.

To increase our program and not our budget while costs have been going up we have had to develop several important short cuts and perfect an efficient operating technique that saves time when time is important.

For one thing, we have to get out at the beginning of a storm; it costs money to wait until the snow has compacted and frozen to the streets, because then it takes longer to remove it. We have found that the faster we get on the streets with our trucks, the better off we are. And the better off motorists are, too, for streets get slippery very quickly here.

Then, too, we have found that we can rely upon materials like rock salt to do an important part of our snow and ice removal job. We use it straight on about 8 miles of downtown streets and mix it with cinders for outlying sections, hills, and railroad crossings. It imbeds the cinders, keeps them from blowing away, and enables us to use less of them. In addition to that, used straight or in the mixture, it reduces the amount of snow that we have to plow and haul away, and in that way it saves a great deal of time and money.

When spread on a light snowfall or sleet, salt helps to melt the fall, aided by the grinding action of traffic, and we get bare, safe pavement very soon after we apply it. If the snowfall amounts to several inches, we have found that the rock salt keeps it from compacting and freezing, so that it is easy to remove. And if by chance it has already frozen or ice has already formed, the rock salt crystals bore down to the pavement, break up the snow and ice, and loosen their bond with the pavement.

Because fast action on our part at the beginning of a storm saves time and money, we keep a careful watch on the weather, and, when a storm is headed our way, we load our trucks and keep them loaded until it hits. In

that way we are able to get onto the streets immediately. That first hour after a storm strikes is the most important time of all in getting safe, clean streets quickly and inexpensively. We keep five trucks going constantly until we have the storm under control.

In this section of Ohio we get a number of snow and sleet storms every winter, with quick-icing conditions. We have found that our program takes care of them effectively, no matter how bad the storms are. Truck operators who travel through this section of the state told us that we are one of the few cities able to maintain snow-free streets throughout the winter.

Stabler Heads Constructors

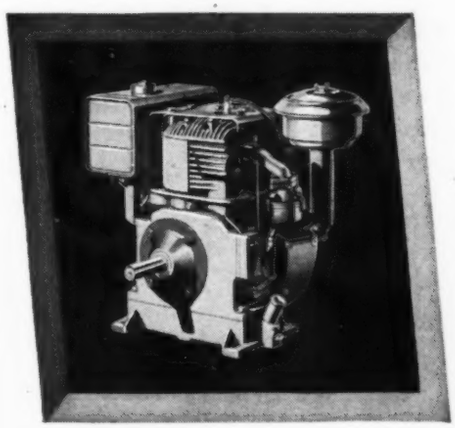
Donald B. Stabler, 635 Lucknow Lane, Harrisburg, was elected president of the Associated Pennsylvania Constructors, state-wide organization of the heavy construction industry, at the association's annual convention held in Philadelphia.

Stabler is a director of the contractors' division of American Road Builders' Association. He succeeds W. C. M. Butler, of Hazleton, who was elected chairman. Re-elected as the association's executive-secretary was A. E. O'Brien, 3741 Walnut Street, Progress, who has served 15 years in that post.

●

37 Cities Spend $83,000,000—Street expenditures by the 37 cities having a population of over 250,000 showed a sharp increase in 1947, according to a recent Department of Commerce report. Capital outlay on highways (principally new construction) were $83 million, plus expenditures for highway operation $98 million. Highway capital outlays jumped from $41 million in 1946. Highway operation expenditures increased from $87 million in 1946.

If You Have a Gasoline Engine Power Problem



"Preferred" Air-Cooled Power

Briggs & Stratton offers you advantages no other manufacturer of single cylinder, air-cooled engines in the world can match.

These are the engineering skill, knowledge, and counsel as well as the unequalled performance that come from *30 years of experience* — plus the advantages of a world-wide service organization. That extra experience, that extra skill assures you the best in design, materials, workmanship, and precision production.

This experience is yours for the asking. Our engineers are ready to counsel with you to help solve your gasoline engine power problems.

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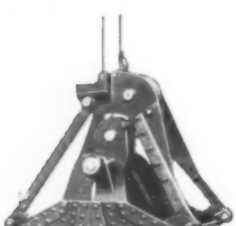
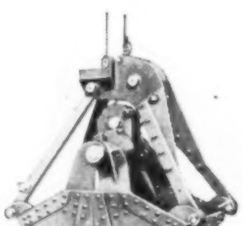
4 CYCLE
BRIGGS & STRATTON
GASOLINE ENGINES
Preferred Power FOR INDUSTRIAL CONSTRUCTION RAILROAD AND FARM EQUIPMENT

HOW TO SELECT THE CORRECT BUCKET FOR THE JOB!

Erie Bulletin 2L-2 describes in detail the design and construction of 4 classes of 2-line clamshells: (*Standard*) for rehandling of loose material, (*Barge Type*) for unloading barges, flats, for stock pile work and for cleaning up material that is loaded to a shallow depth and distributed over a large area, (*General Purpose*) for the broad range of general contractor requirements, including medium heavy excavating and the rehandling of compact materials, (*Hard Diggers*) for severe underwater digging and the most difficult earth excavation where unusual durability is demanded.

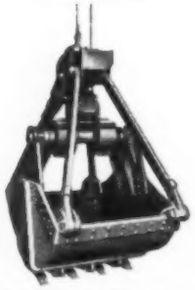


Erie Standard Rehandler



Erie General Purpose Clamshell

Erie Barge Type Rehandler



Erie Hard Digging Clamshell

Consult Gross Load Tables *under each of 4 classes of Erie 2-Line Buckets. This gives the gross load for each of 43 Standard buckets in 9 kinds of material. Is your crane under or over loaded on bucket work? Drop us a line giving your make and size of crane and the kind of materials to be handled. We'll show you how to get maximum output on bucket work. A little attention to this important factor may pay off the cost of the correct bucket on a single job.*

Write FOR BOOKLET 2L-2

ERIE

STEEL CONSTRUCTION COMPANY

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Hydrated Lime

for Stabilizing Roadway Materials

By Chester McDowell
Senior Soils Engineer
Texas Highway Department
Austin, Texas

Presented at 30th Annual Convention, National Lime Association, Hot Springs, Virginia

IN 1945, D. E. H. Manigault, district engineer, Dist. 14, Texas highway department, contacted the laboratory about making tests on clay gravel-lime mixtures. In the meantime the laboratory had partially completed the development of a strength test procedure for testing soils and base materials. The tests performed indicated that the mixtures were suitable for use, and that there were advantages in moist curing followed by dry curing the stabilized base prior to applying surfacing. Noticeable reductions in the plasticity indexes were also observed.

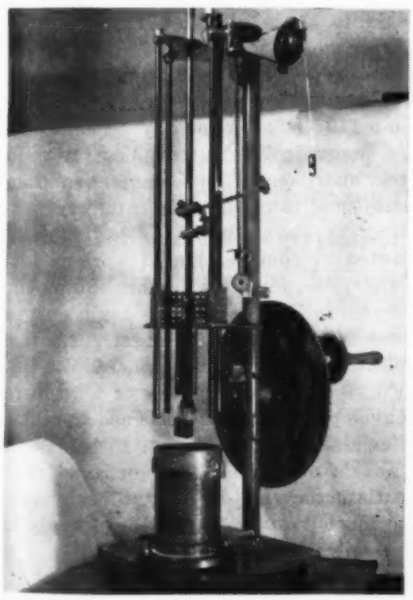
Mr. Manigault's interest was spurred by the results of the tests and, through his determination, our first, truly experimental, lime-treated road sections were constructed in August, 1945. Other experimental sections, where increased strength due to the addition of lime was not a major factor, preceded these with conflicting results. It is our thought that some additional strength, due to the addition of lime, is necessary in order to justify the expense. However, the additional strength secured does not always have to be of a very great magnitude.

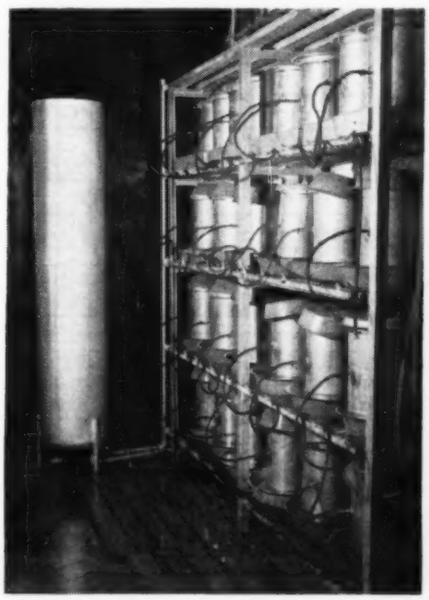
Waste Lime Studies

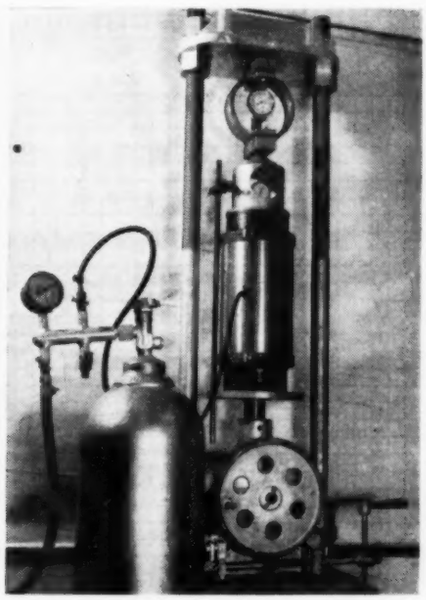
In construction, lime stabilization has been applied almost exclusively to granular flexible base materials. A "waste" lime was used in rebuilding the original short sections of base that were failing because of too plastic a binder.* Over a period of years this product had been mechanically rejected at the hydrator of a lime plant. It contained 80% to 100% moisture and approximately 75% calcium hydrate based on dry weight. A 6-in. thickness of old gravel road was scarified, air-dried, mixed with 3% lime (based on dry weight) by blading with maintainers, moistened, windrowed, bladed into 2-in. layers, thoroughly compacted (with pneumatic roller), moist cured a few days by sprinkling, dry cured a few days and sealed with a bituminous surfacing. These original installations, built more than 2½ years ago are still in nearly perfect condition. Cores cut from the projects have greater strength than the original laboratory specimens. Fragments of such cores are presented to demonstrate the nature of some of

*See Roads and Streets, Aug., 1947, "Lime Stabilization and Low Cost Road Construction," by W. D. Dockery, district engineer, Texas Highway Department, Austin.

★ Fig. 1. Specimen capped with porous stones and several views of the pressure cells







★ Left: Fig. 2. Compaction device. Center: Fig. 3. Rack in moist room. Specimens subjected to capillary wetting, lateral pressure (from constant pressure manifold), and vertical surcharge (annular lead weights). Right; Fig. 4. Screw jack press with proving ring, deformation dial, surge tank, pressure gauge and accessories. Specimen in pressure cell ready for testing

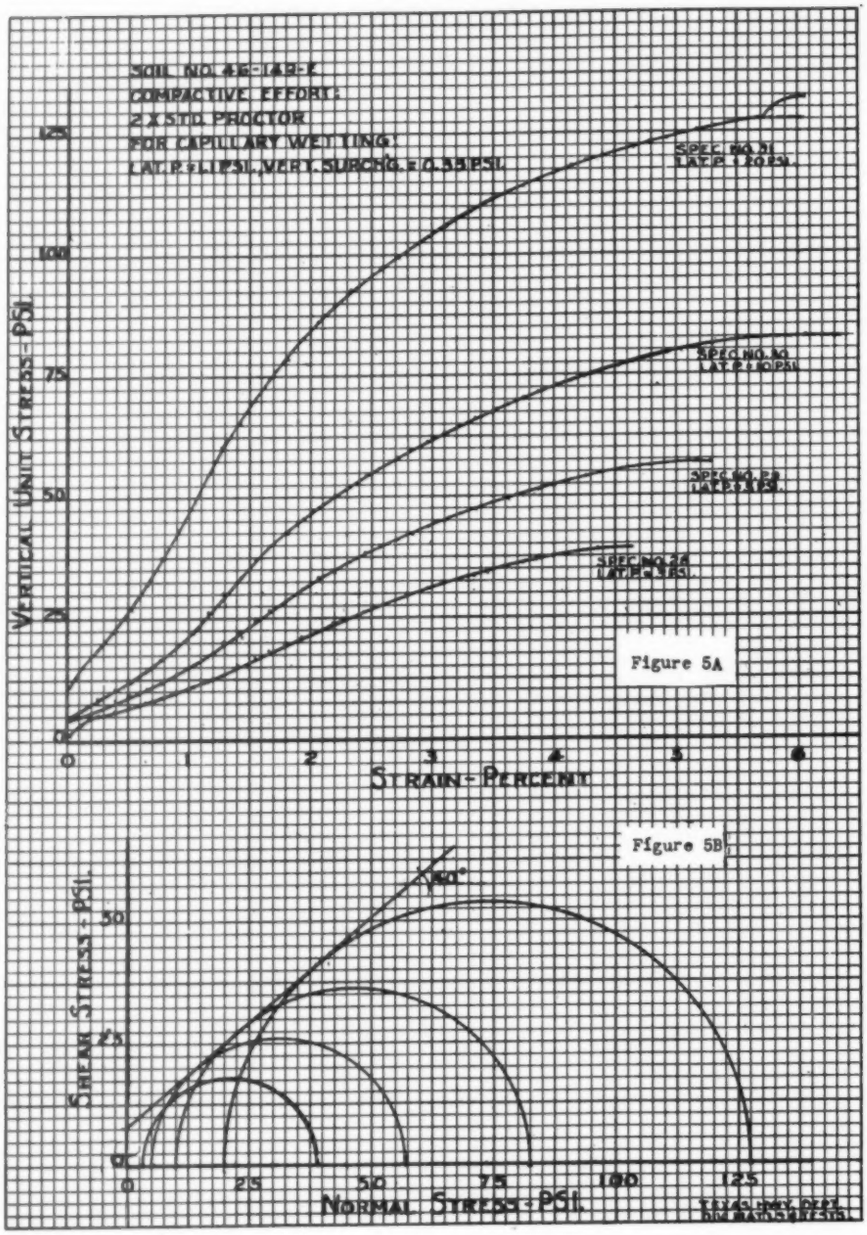

SOIL NO. 46-1AR-K
COMPACTIVE EFFORT:
2 X STD. PROCTOR
FOR CAPILLARY WETTING:
LAT. P. = 1.1 PSI, VERT. SURCHG. = 0.38 PSI
SPEC. NO. 3A
LAT. P. = 20 PSI.
SPEC. NO. 4A
LAT. P. = 10 PSI.
SPEC. NO. 2A
LAT. P. = 5 PSI.
VERTICAL UNIT STRESS - PSI
STRAIN - PERCENT

Figure 5A

Figure 5B

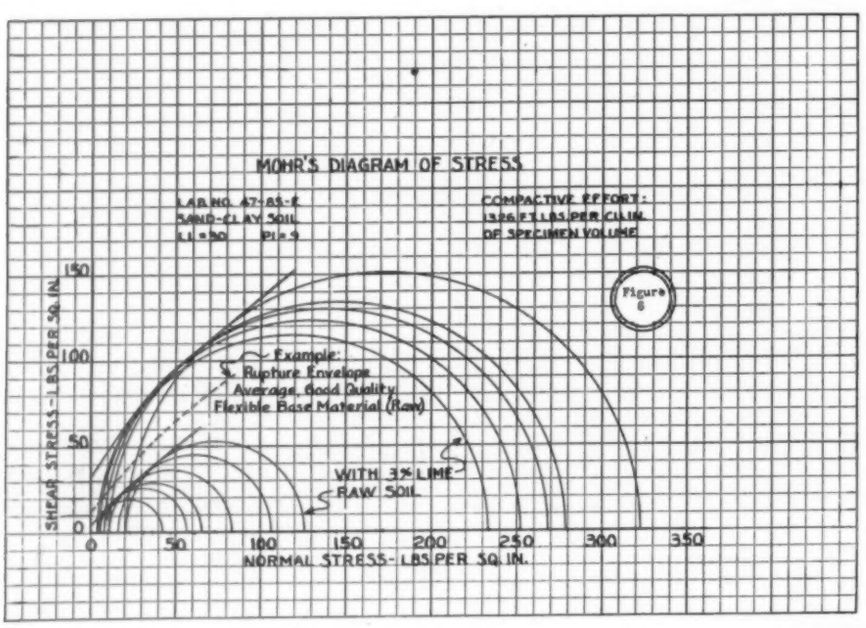


Figure 6

the products produced. District engineers W. D. Dockery of Austin and Thomas C. Davis of Corpus Christi used lime-stabilized, granular mixtures in the construction of low cost roads under contract. There are now some 60 to 75 miles of lime-treated base in Texas.

Freeze-Thaw Tests

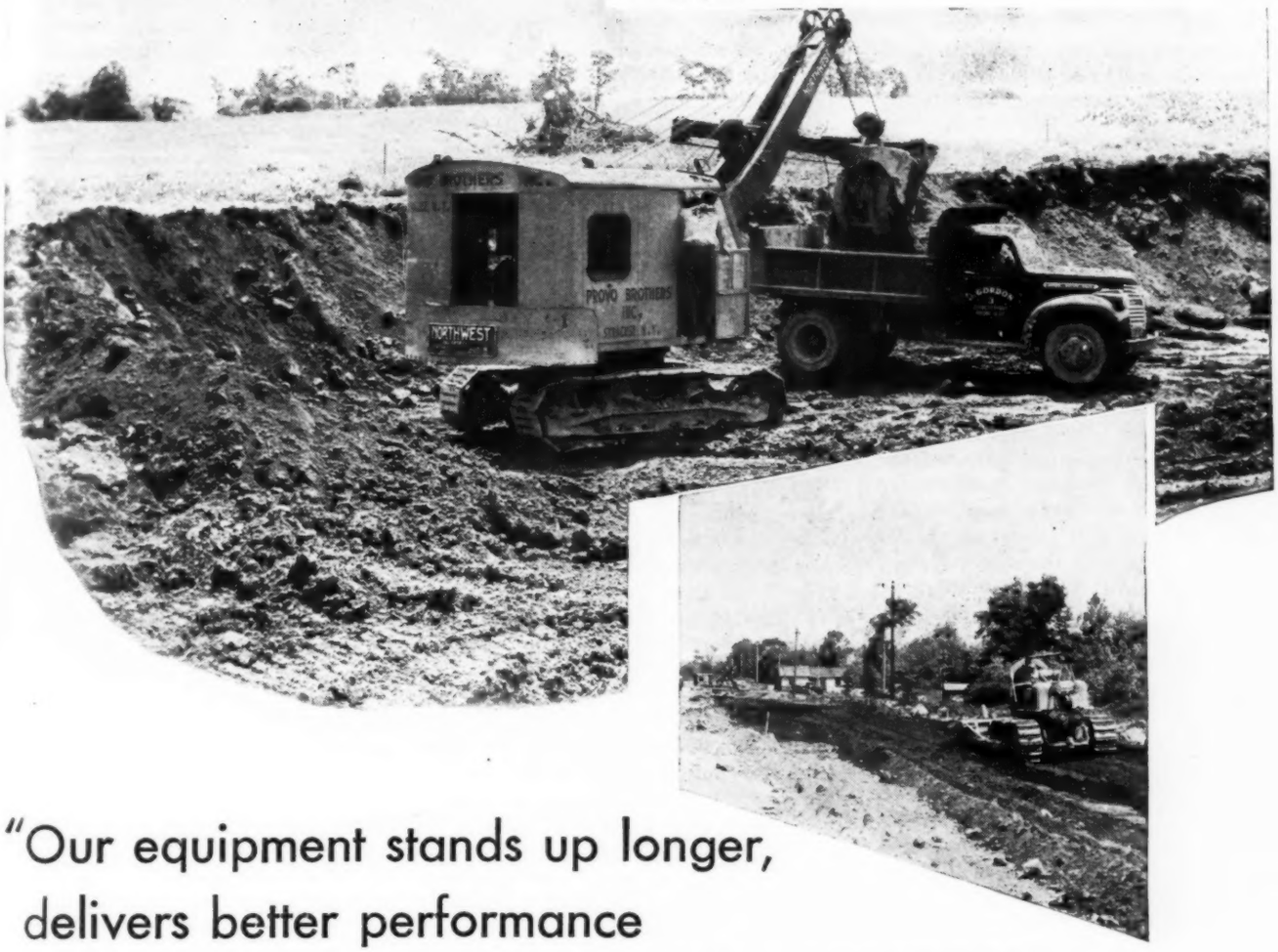
There seems to be some doubt in the minds of some as to the ability of lime-stabilized mixtures to resist damage due to freezing. Specimens exhibited here [at the convention] have been through six cycles of freezing and thawing. The specimens were saturated while frozen and the water removed by drying after each thawing. Our experiences on this subject are limited because Texas is not located in an area where serious freeze or frost damages occur; however, considerable damage to flexible pavements has been evident in certain areas of the state during the last two winters. The lime-treated sections in areas where freeze damage occurs have shown no signs of distress from this cause. Some sections of untreated caliche bases, which were damaged by freezing the first winter, were treated with lime. These sections withstood last winter's very adverse freezing conditions without distress while additional sections of untreated base continued to fail.

Both field and laboratory experience increased as various projects were built. Through this experience the laboratory established the use of a triaxial compression test method.

Fig. 2 illustrates the compaction equipment being used to mold laboratory specimens to densities comparable to those obtained from rolling. After molding, specimens are weighed, measured for height, removed from mold, moist cured seven days, air dried in a 140° F. oven one day. Then cells, as shown in Fig. 1, are placed around the specimens. Specimens are then subjected to ten days of capillary wetting, as shown in Fig. 3, and finally tested in compression at various lateral pressures, using the equipment shown in Fig. 4. Stress-strain curves and Mohr's diagram of stresses are plotted, as shown in Figs. 5A and 5B. Fig. 6 shows an example of a rupture envelope for average, good quality, flexible base materials plotted on a Mohr's diagram. It is believed that satisfactory soil-lime mixtures should produce results that will plot above the envelope mentioned.**

**Further details are given by the author in the 1946 Proceedings of the Highway Research Board and by the author and W. H. Moore in a paper prepared for the Second International Conference on Soil Mechanics and Foundation Engineering.

Provo Brothers, Syracuse, N. Y., recently completed a $906,000 contract on State Highway #12 between Remsen and Boonville, Oneida County, N. Y. Gulf lubricants helped keep equipment operating smoothly and efficiently on the job.



"Our equipment stands up longer, delivers better performance with GULF QUALITY LUBRICANTS"

says this Contractor

Provo Brothers of Syracuse, New York, is one of many leading contractors who have found that better lubrication with Gulf quality oils and greases is reflected in the operating records of equipment.

Engineered into Gulf lubricants is greater stability and endurance—they stand up and provide better protection to contractors' equipment under all types of operating conditions. Mud or dust—hot or cold, Gulf lubricants insure top-notch performance and a minimum of mechanical delays.

It will pay you to use Gulf quality lubricants on your next contract. Ask a Gulf Lubrication Engineer to recommend the proper types and grades exactly suited for your particular requirements.

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Our experience has led us to believe that many natural soil materials contain pozzolanic substances which react with lime solutions at ordinary temperatures to form stable, cementitious compounds. Pozzolanas have been described as high siliceous substances, often of volcanic origin. Diatomaceous earths or shales and many clays, notably bentonite, must be included. They may be composed of silica, silicates, alumino-silicates, or a mixture of these, in an amorphous, glassy state. Combination with lime forms stable gels, whose stability is not impaired by leaching. There is general agreement in the literature that the reaction between lime and pozzolanic soils continues over a long period of time. The use of such mixtures for strengthening granular soils and sands is one of the oldest arts known to man. Such materials have been used in the construction of the Appian Way, massive footings for bridge piers in China, mortars for dams in India and plasters throughout the world. In cases where most successful results have been obtained, the use of certain clays have been employed. The clay has, in some instances, been burned with the stone to produce a lime (usually a hydraulic lime). In other cases, clay and regular hydrated lime have been added to granular materials to form the mixture desired. The strength of such mixtures appears to be considerably in excess of that of ordinary lime-sand mortars made without the addition of portland cement, as is illustrated by the mortar mixes in the jars. These mixtures contain the same amounts of lime and have been cured in a similar manner. The firm samples consist of lime and a pozzolanic soil, whereas the weak, crumbly specimens consist of lime and washed sand. *The erroneous conception that soil-lime mixtures are all as weak as lime-sand mortars has delayed the advancement of soil-lime stabilization as much as any other single factor. It has indeed been unfortunate that this type of construction has existed largely as an art and that no scientific utilization of such materials for highway construction has been proposed or used in this country.*

Proposes More Research

It is believed that the use of lime for stabilization of soils could be extended to other areas best by taking the following steps:

1. To create a better understanding of soil-lime on the part of the public in general, and especially among the engineering and constructions professions.

2. To conduct additional research both in the laboratory and in the field leading to methods of testing and controlling quality of mixtures.

3. To produce a lime stabilizing product at less cost. Perhaps this could be motivated by foregoing certain color and chemical content refinements for current products. Another method might be to utilize rotary kilns in the production of such a product. Since the previously described, successful, primary installations were treated with waste lime, this proposal deserves serious consideration.

This three-way program may sound difficult, but the potential market that is at your grasp is such that you cannot afford to be evasive in any respect. As an illustration, consider the following assumptions:

1. That soil-lime stabilization proves to be in high demand.

2. That the product is produced at an attractive price.

3. That each of our 25 Texas districts would desire to construct 30 miles of soil-lime stabilized bases in a period of one year. This is not unreasonable, since District 14 has built lime-treated bases at this rate for the past two years in spite of the current high price of lime.

If these assumptions proved to be true, this would create a demand for about 100,000 tons of lime in one year for our state's highway work alone, not to speak of other projects to be instigated by various municipal, county and Federal governmental agencies. To maintain the current market, and at same time produce one hundred thousand tons for highway work, it appears that the current rate of lime production in Texas would need to be increased approximately 65%. It is believed that this is a very conservative appraisal of this potential market of lime, if a suitable low-cost lime product can be produced. If the cost of lime cannot be lowered materially, the above appraisal is probably exaggerated.

It is obvious that we have a problem of mutual interest. We want to build more road mileage at lower costs and this can be accomplished partially by obtaining lime at an attractive price. When this is done, the demand for lime will increase automatically. An increase in the demand for lime should be of paramount concern to you, and the best way to accomplish this is to make your price more attractive. Therefore, we are both interested in the price structure of this product.

In closing, it should be emphasized that the possibilities of increasing the demand for lime are tremendous, but it will require a large amount of effort over a considerable period of time, involving modifications in production methods, and the establishment of the use of high quality mixtures through research. There is little doubt in my mind that salesmanship, based primarily upon facts and good judgment, plus a strong determination, will also do much to bring these things into reality.

(The foregoing paper by authority, R. J. Hank, Materials and Tests Engineer, Texas Highway Department.)

How We Whipped Sand and Water on the Outer Banks Job

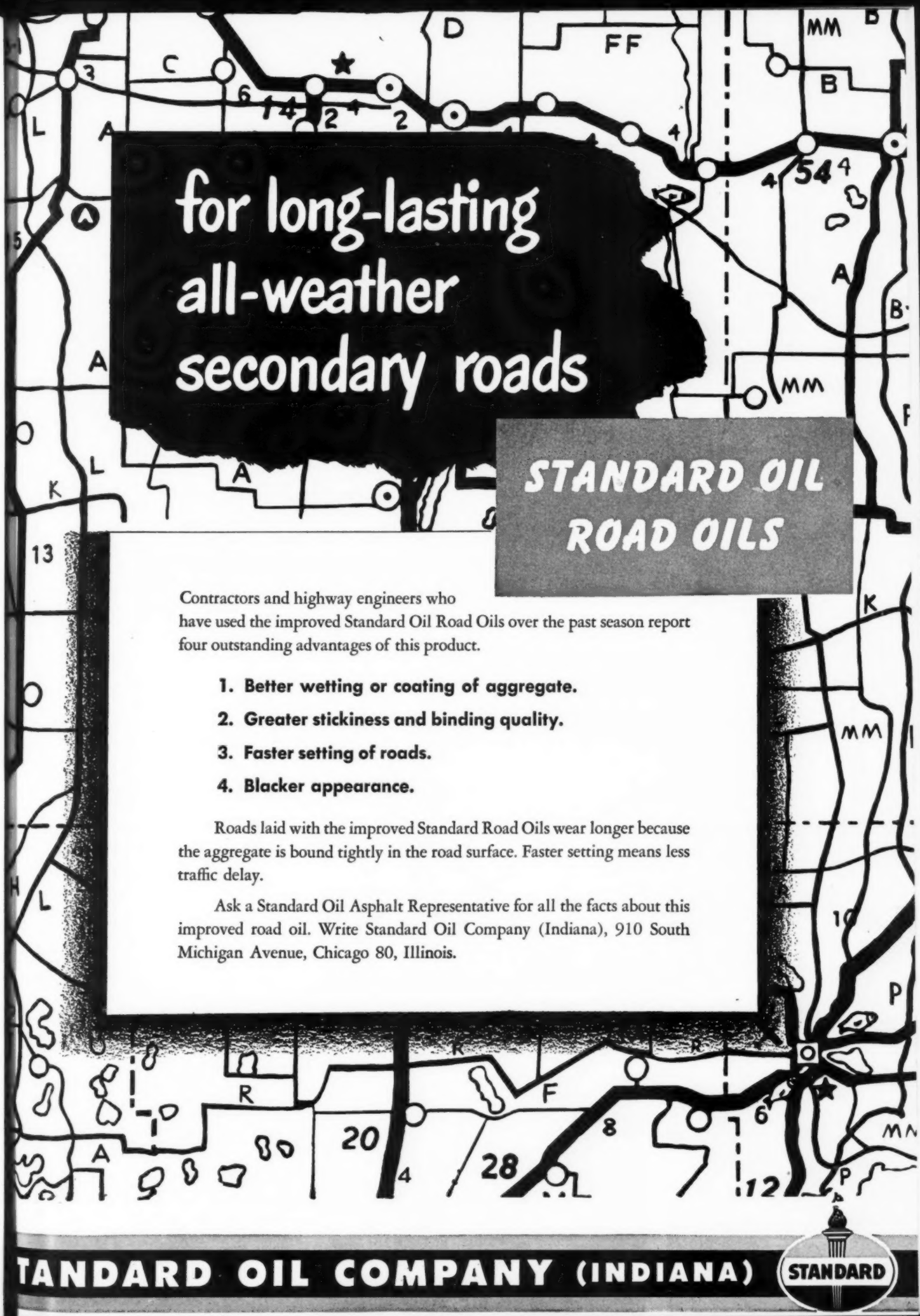
(*Continued from page* 76)

barge. The sunken barge came up decks awash. The equipment was towed into Englehard and unloaded, and the barge was towed in and the water pumped out with 6-in. pumps. All equipment had to be dismantled, steamed, cleaned and reassembled to stop the erosion—a very expensive and tedious operation.

In May, 1948, the contractor moved back to complete the work. The first operation was that of loading and hauling stockpile material to wash-out places. Then by taking motorgraders, Seaman mixers, and disc harrows, the contractor began the aerating and finishing operation. With June and warmer weather the first step was to rip the road open with scarifiers on the graders, followed by the disc harrows and then the Seaman mixers. This aerated the top. Then by blading the top 2 to 3 in. of material to one side, the same operation cured out the bottom layer.

The bottom layer was compacted with traffic rollers. The top layer was pulled over the bottom layer and shaped with blades to typical section. This was followed by traffic rollers and finally finished and sealed with a Buffalo-Springfield tandem roller (5-7 tons). This operation was handled in sections 2000 ft. long. Three sections were worked simultaneously consisting of opening-up, aerating, and finishing. The results achieved were in direct proportion to the warmth and sunshine. In June and July the contractor was able to finish as high as 6,000 ft. on some days, actually opening up as much as 12,000 ft. of work on best days.

The shoulders were dressed down, the brush burned, and the project taken over by the maintenance forces in July. The natives assisted in cleaning up the brush and stumps by hauling the debris to the beach sections, it being their hope that this material would act as a sand fence, collecting the sand in dunes and thus serving to protect the road.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all-weather
secondary roads
STANDARD OIL
ROAD OILS
Contractors and highway engineers who have used the improved Standard Oil Road Oils over the past season report four outstanding advantages of this product.
1. Better wetting or coating of aggregate.
2. Greater stickiness and binding quality.
3. Faster setting of roads.
4. Blacker appearance.
Roads laid with the improved Standard Road Oils wear longer because the aggregate is bound tightly in the road surface. Faster setting means less traffic delay.
Ask a Standard Oil Asphalt Representative for all the facts about this improved road oil. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.
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STANDARD

New Type Machine Available for High Speed Joint Cleaner

(See also "New Equipment and Materials" section)

TO save time and allow better results in pavement-joint maintenance, a high-speed concrete grooving machine has been put on the market in recent months. With convenient self-propelling action and operated by one man, the new machine rapidly removes old seal and simultaneously cuts a clean, correctly-profiled groove to form a tight bond with the new sealing material. The ROADS AND STREETS editors have seen some of the many devices built in highway maintenance shops to expedite the big-scale task of joint cleaning (R&S Jan. '49), which is still a voracious eater of high priced labor nearly everywhere.

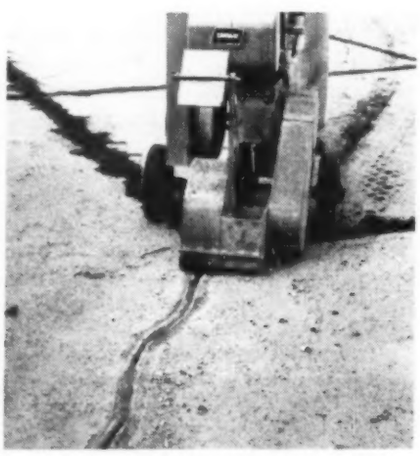
Joint-cleaning capacity of the machine, as reported by highway and airport maintenance engineers, ranges from about 5,000 to 20,000 lin. ft. per day. Speed in each case depends chiefly on the type of concrete, size and condition of joints, width and depth of desired cut, local traffic conditions and on the individual skill of the operator.

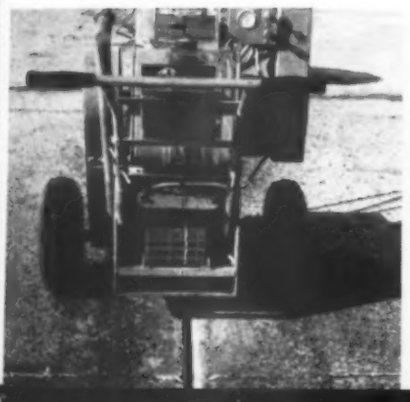
Designed for fast, heavy duty work, this machine is powered by a 13.3 h.p. air-cooled Wisconsin gasoline engine, equipped with self-starter, generator and storage battery. The manufacturer, by the way, is the G. H. Tennant Co., of Minneapolis, Minn.

Cutting action is provided by a series of 4-in. forged tool steel cutters mounted on a heavy steel cutter head that revolves at 2,400 rpm. By changing spacing of the cutters, joints or fissures from ⅜ in. to 2¼ in. wide can be cleaned and regrooved to desired dimensions. Depth of cut is about 1¼ in.

To allow full use of the machine's joint-cleaning speed, an extra cutter head (installed in 2 minutes) is usually supplied. Worn cutters can then be replaced without holding up the machine. Correctly balanced on two wheels, the unit can easily be rolled out of way of traffic. It weighs less than 700 lb.

★ Unretouched photos of joints and cracks being cleaned by the concrete grooving machine. Shows uniform groove and clean sidewalls, free of bituminous smears. Photos include rear of machine, showing semi-inclosed battery, wide-spaced wheels and adjustable operating handle. Self-starter button is opposite engine near top of photo





Expressways—Some Cities Are Beginning to Get Them

(*Continued from page* 54)

Minneapolis, involving costly railway grade separation.

Boston. This city, with one of the nation's worst congestion snarls, has a $322 million Master Highway Plan for the area, taking in suburbs. Lack of agreement on financing has slowed progress. The plan includes an outer belt and seven radial expressways, one contract section of which has been begun by the state department of public works. The total system length would be 87 miles. Fitting into that program, work began early in 1948 on a $27 million project for the Mystic River toll bridge over Boston Harbor.

Also being considered for early construction is a new tunnel, parallel to the present Sumner Tunnel to East Boston, resulting in a twin-tunnel one-way system with an elaborate plaza and interchange on the Boston side and connections to the express highways and the airport on the other side.

New Jersey. The very large program of expressways and parkways under way in this state will be reviewed in a forthcoming issue of R & S.

●

Engineering schools of Princton and Lehigh Universities recently selected New Jersey road and bridge construction for field studies by its Civil Engineering students. The studies involved brief inspection trips.

Equipment Men Foresee Good Year but Keener Competition

(*Continued from page* 66)

and he traced the development and accomplishments of Associated Equipment Distributors up to the current Convention.

He pointed out that the Association brought together and consolidated a new, unsettled industry for the mutual benefit of distributors, manufacturers, contractors, the government and the public at large.

Taking a look at the next thirty years, Mr. Arnold stated emphatically that, while the Association has served and served well since its inception, the future holds much greater achievements. Distributors are strong financially, carry substantial inventories and are well staffed with qualified personnel in both sales and service. He predicted that the distributors will become even stronger.

CONCRETE PAVEMENT
means lower street lighting costs

IN a study of street lighting costs based on an actual municipal rate, it was found that it would cost $483 per year to provide adequate lighting* for 1,000 feet of a dark-surface street 40 feet wide. For light-colored concrete, which has the highest light reflectance of any pavement, the cost would be only $283.80, a saving of $199.20, or more than 40 per cent.

Over a 25-year period this saving in street lighting costs would amount to about $5,000 for every 1,000 feet, or more than $26,000 for every mile of 40-foot pavement.

Reduced lighting costs are only one of the many economies of concrete pavement for streets and airports. Concrete's first cost is usually less than any other pavement of equal load-carrying capacity. It costs far less to maintain. It renders long years of uninterrupted service. It saves on gas, tires and car repairs. It is truly the ***low-annual-cost*** pavement.

*Lighting recommendations are based on light reflectance as determined by the Committee on Street and Highway Lighting of the Illuminating Engineering Society. The Committee made a study of the subject in an effort to reduce traffic fatalities, which are three times greater at night than during the day. Using concrete's light reflectance of 20 per cent as a base, the Committee recommends proportionate increases in illumination for other pavements—up to 100 per cent more for dark-colored pavements with a light reflectance of only 5 per cent.

PORTLAND CEMENT ASSOCIATION

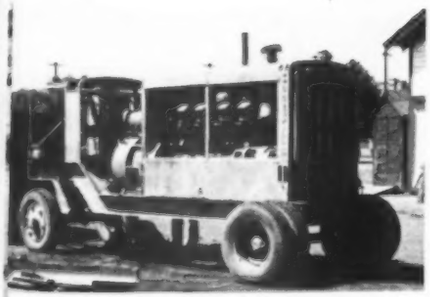
DEPT. A2-28, 33 WEST GRAND AVENUE, CHICAGO 10, ILLINOIS

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

At M-K's Home Shop

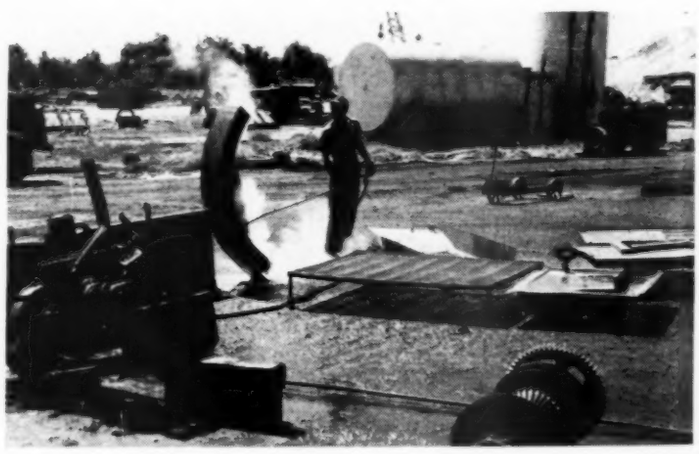
With 18 acres of shops, warehouses and yards at Boise, they're fixed to overhaul, rebuild, or build anything

MORRISON-KNUDSEN Company, Inc., is one of the big fellows in the contracting business, with projects scattered all over the globe. Their Boise, Idaho, headquarters shop and yard facilities are quite a sight, particularly at busy periods when equipment is being overhauled between jobs, which is most of the time. This place isn't fancy, but it is spacious and well equipped, with every kind of labor-saving equipment from run-about cranes to annealing ovens for drill bits to steam cleaning apparatus. Here are a few photos snapped at the M-K headquarters by the R&S editor.



★ Seen also in the M-K yard was this rigged-up auger for fast work on post holes and soil sampling

★ You see most everything at one time or another here—this diesel generator is mounted on an improvised frame for heavy towing



★ Steam cleaning—a boon to economy and good workmanship in overhauling

★ (Top of page): One of several highly mobile cranes which scuttle between shop buildings and storage yard. Here seen handling a casting that had just been welded

★ Storage building at left, with heavy bumper timber and bed-high platform. Main shop building in rear. Note spaciousness of yard, for quick turning and maneuvering

You can't sue a subgrade for lack of support

When water-filled subgrades are guilty of non-support they cost you plenty in excessive maintenance. Then the only way to keep expensive pavements from "cracking up" is to drain the water out and keep it out. You can do this with ARMCO Perforated Pipe.

Efficient, economical subdrainage comes easy with ARMCO Pipe. Unskilled workmen quickly join long lengths with simple band couplers. There are fewer sections to lay—fewer joints to assemble. Installation goes fast and labor costs are low.

Your ARMCO Subdrainage System assures long, trouble-free service. ARMCO Pipe has proved strength to resist crushing, cracking or disjointing under the impact and weight of heavy loads. There is no danger from shifting soils or severe frost action. Clogging is no problem. Scientifically placed holes collect unwanted water and drain it off along the pipe invert.

Use ARMCO Perforated Pipe for installing complete highway drainage systems or for patching up trouble wherever it occurs. Then you can be sure that valuable pavements are resting on a firm, dry foundation. You'll save maintenance dollars and motorists will enjoy a safe, smooth ride. Write for complete information. Armco Drainage & Metal Products, Inc., 625 Curtis Street, Middletown, Ohio.

ARMCO

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PERFORATED PIPE

How to Install Spring Loaded Oil Seals

This article gives helpful advice on the installation of spring loaded oil seals. Oil seals, no matter how perfectly manufactured, must be carefully and correctly installed if they are to give proper service

By the Service Division, Allis-Chalmers Tractor Division, Milwaukee, Wisconsin

IT TAKES a good oil seal to retain the oil in gear cases under ordinary circumstances, and an even better seal when traversing hilly terrain where the oil level is often higher than the oil seal itself. In one way or another, in today's operations, these latter conditions are constantly encountered.

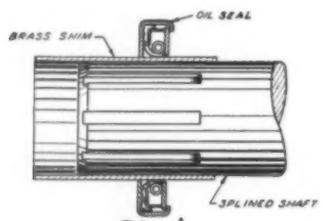

Fig. 1

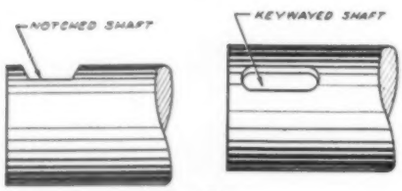

Fig. 2

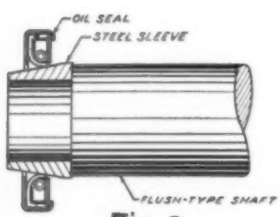

Fig. 3

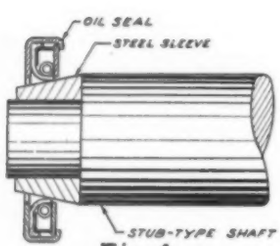

Fig. 4

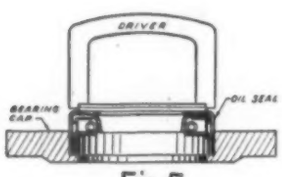

Fig. 5

A point of perfection must be reached not only in the manufacturing of seals, but also in their installation, if complete sealing results are to be expected. As an aid to the men who install seals in the field, the following diagrams with their explanations are presented. If mechanics and operators know these facts, it serves as a help in dealing with oil leakage problems when they are experienced.

When oil leakage occurs, it may be that the seal was damaged when installed or that the oil level is too high. However, if a recurrence of oil leakage is experienced on a field installation, the cause is probably improper insertion of the seal—causing damage to the sealing lip by forcing it over rough surfaces of a shaft, or distortion of the seal case by driving it in place with a hammer.

When new seals are installed, be sure to remove any excess end play or eccentricity of the shaft. The life and effectiveness of a seal largely depend on this adjustment. Should a shaft have to be installed through a seal which is in place, as much weight as possible should be taken off the shaft, or the seal is likely to be damaged in assembly.

Before Installing

Before installing, always submerge seal in oil or coat it with grease to facilitate assembly and prevent damage when the machine is started. Surfaces on the shaft where the sealing member contacts the shaft should be polished smooth with fine abrasive cloth, adding to seal life.

Figure 1. With this method a piece of brass shim stock is used to slide the seal over the splined end of a shaft. Ends of the shim stock must overlap in proper cylindrical form and care should be exercised that the shim stock has no rough edges that will damge the sealing lip.

Figure 2. When oil seals must be installed on keywayed or notched type shafts, the procedure as followed in Figure 1 can be used.

Figure 3. On a flush-type shaft, a steel sleeve fitting up against and very slightly over the shaft is used to protect the sealing lip. Care must be exercised to avoid stretching the sealing member beyond its working diameter. To guard against damage of the lip, the outside diameter of the sleeve should be polished.

Figure 4. For stub-type shaft applications a steel sleeve is made to fit over the stub and up against the shaft face with the largest diameter the same as, or very slightly larger than, the shaft. Again, care must be taken that the seal is not stretched, and the outside diameter of the sleeve should be polished.

For applications 3 and 4 suitable sleeves can be made locally at small cost to fit any size and type shaft.

Constructing a Driver

Figure 5. A driver, like the one shown here, can be easily constructed for use in installing seals in bearing caps. For occasional installations, the old seal or a flat plate larger than the seal can be used. Too many times mechanics drive seals in place with a hammer, and by the time the seal is in place it has been distorted to a point where the seal cannot function properly. By use of a driver properly made, the strain is applied to the outer structure of the steel case. When available, a press should be used. If manual effort is used to drive the seal in place, care should be exercised to distribute the driving force evenly around the outer edge of the seal. Do not allow the seal to become cocked during its installation. By applying white lead to the bore of the bearing cap into which the seal is to be installed, a better seal against leakage will be obtained.

Sealing direction is determined by the purpose of the seal on the shaft. Where the housing contains lubricant which must not leak out the sealing member lip should be faced toward the lubricant. Where the purpose of the seal is to permit expulsion of matter, the sealing lip should be faced away from the housing.

Generally speaking, spring loaded oil seals will retain oil if properly installed. Following the installation directions set forth here, it is possible to correctly place seals in position, without fear of damage to the seal.

●

Gas Tax Receipts Increase $140,000,000—Revenues from state gasoline tax receipts in 1948 are estimated at $1,350,000,000, an increase of more than $140,000,000 over the 1947 total.

WHY ARE YOU IN THE HAULING BUSINESS?

WHETHER hauling is your main business, or only incidental to it . . . this is certain:

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You can save *plenty* of money with trucks that fit your job . . . Dodge *"Job-Rated"* trucks.

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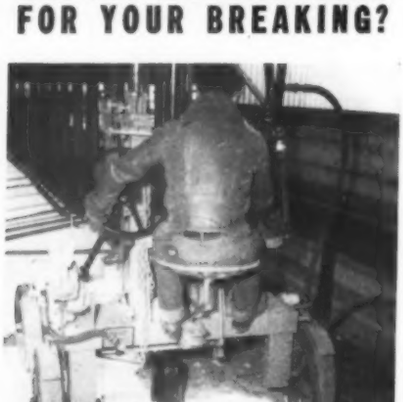


THE MIGHTY MIDGET

Shown breaking out 8500 square feet of platform supported by heavily reinforced concrete beams 12" x 14". Machine readily demolished slab and beam together, breakout out an approximate 6000 square feet in six hours' time, powered by 160' compressor. Total thickness where beam intersected—20".

Ask your dealer or write for information.

R.P.B. CORPORATION
2751 EAST 11th STREET · LOS ANGELES, CALIFORNIA

NEW EQUIPMENT AND MATERIALS

New Construction Equipment and Materials

Compressor

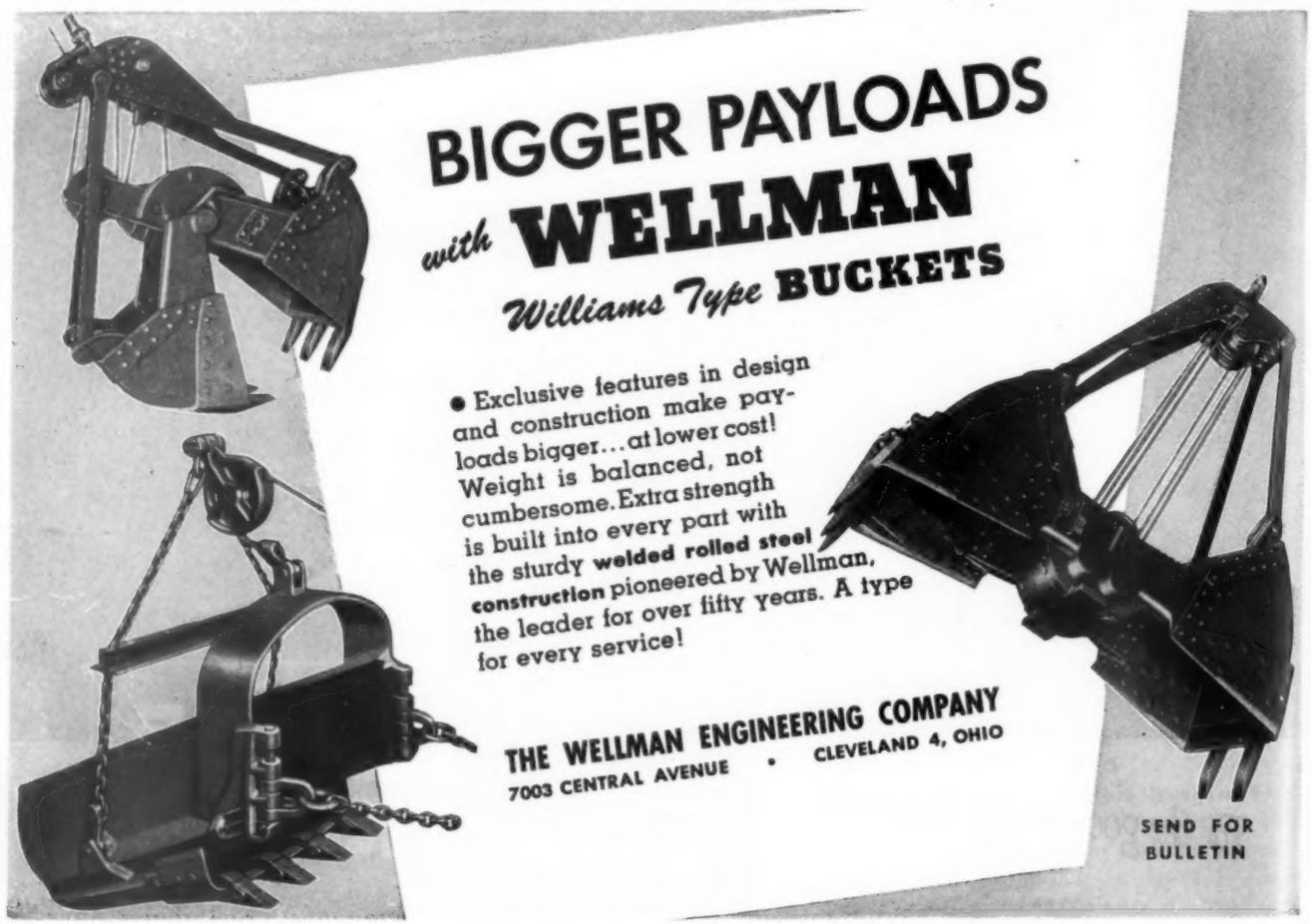
A new compressor announced by O.K. Clutch and Machinery Co., Columbia, Pa., uses Ford motor and standard automotive parts, which can be obtained at any United Motors Service station, thus eliminating delays in securing parts. The compressor weighs 950 lb. with skid mounting and 1,100 lb. with trailer mounting. It delivers 60 cu. ft. of free air and can be easily towed or carted to the job. Air tank capacity is 4 cu. ft. Use of an extra large air receiver enables maintenance of greater air supply without overworking parts. It is water jacketed to protect against overheating for efficient operation in all climates.

OK Compression SS60

General Utility Ditcher

The pilot model Buckeye 406 general utility ditcher, introduced recently, has undergone refinements and is now in full production by Gar Wood Industries, Inc., Findlay Division, Findlay, O. The 406, one in a series of new Buckeye Ditchers, is of the boom type. All welded

Buckeye Model 406 General Utility Ditcher


BIGGER PAYLOADS
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Williams Type BUCKETS
• Exclusive features in design and construction make payloads bigger... at lower cost! Weight is balanced, not cumbersome. Extra strength is built into every part with the sturdy welded rolled steel construction pioneered by Wellman, the leader for over fifty years. A type for every service!
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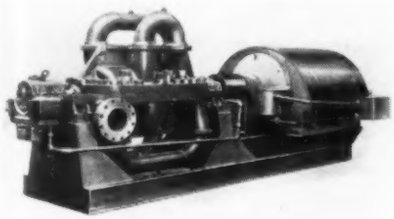
SEND FOR BULLETIN

box section boom telescopes; lower section nests in upper section for 6 ft. digging depth. Fully extended boom digs to 8 ft. depth. Diagonal boom affords faster penetration in starting a cut and provides undercutting of walks and drives. Ditch from 17 in. to 24 in. wide can be rapidly cut. Bucket cleaner insures the removal of spoil and full bucket loads. Rooter point speeds are 91 ft. and 202 ft. per minute. Road speeds up to 3.38 m.p.h Machine digs forward or reverse. Boom is raised and lowered by hydraulic power. The well-known constant center drive, long a feature of Buckeye ditchers, assures proper tension on bucket line drive chain at all times. The 406 is mounted on a standard Alligator crawler unit. Simplified controls are within easy reach of operator. Truck type starter, ignition, cooling system and instrument panel facilitate easy operation. Bulletin 406 graphically describes the new 406 ditcher; sent on request.

Boiler Feed Pumps

Four new boiler feed pump sizes have been added to the line of centrifugal pumps of Worthington Pump and Machinery Corporation, Harrison, N.J. Two of the new sizes are 6-in. pumps and two



Worthington Boiler Feed Pump

are 8-in. pumps, which add to the range of possible applications for this type of service. Complete new bulletin on Worthington boiler feed pumps, known as Bulletin W-318-B7E, contains all data and specifications.

2 HP Engine

Using new light weight materials, a 2 HP air-cooled engine with twin opposed cylinders, developed by Power Products Corporation, Grafton, Wis., weighs only 23 lb. The engine is 11½ in. x 13½ in. x 14½ in. over all. It can be used either vertically or horizontally.

Model 3000 2 HP Engine

Light weight and compact design are stated to have been obtained without sacrifice of ruggedness. Special attention has been given to the carburetor and magneto, and the engine starts easily, operates smoothly and without stalling

Gorman-Rupp pumps in action on storm sewer job in Corpus Christi, operating at 20 ft. suction lift. Jay DePuy and E. C. DePuy, contractors, are using 14 Gorman-Rupp's on this job.

ON-THE-JOB --

Performance IS WHAT COUNTS!

When you're keeping a hole dry or holding a river back, priming speed, efficiency and dependability of your pump means everything.

Gorman-Rupp self-priming centrifugal pumps can help you complete your contracts on time and at a greater profit. They challenge any contractors' pump, size for size, to equal their all around performance.

We invite you to give these new Gorman-Rump pumps an ON-THE-JOB test for your own satisfaction.

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Made in all sizes: 7M - 10M - 15M
20M - 40M - 90M - 125M

Ask for the new Contractors' Bulletin No. 8CP-11

THE GORMAN-RUPP COMPANY
MANSFIELD, OHIO

even at tilts up to 45°. By incorporating twin opposed cylinders in the design vibration has been reduced to a very minimum.

A-W Graders to Be Made in England

Austin-Western Co., Aurora, Ill., and Aveling-Barford, Ltd., Grantham, England, have linked their interests by forming a new English company to be known as Aveling-Austin, Ltd. This well known English manufacturer of road machinery will build the Austin-Western model "99-H" power graders which will be marketed by the newly-formed company, Aveling-Austin, Ltd., chiefly throughout the Sterling area. The conversion of drawings and tools to British standards is now in process and it is expected that actual production will be started late in 1949.

Non-Freezing Hydrant

A new design in "frost-proof" hydrants, eliminating the need for underground pits, gravel boxes, drainage lines, sump pumps, special insulation and electric heating coils has been introduced by Crane Co., 836 So. Michigan Ave., Chicago 5, Ill. A new approach to the frost-proof hydrant was taken in the design. Water actually is allowed to remain in and to freeze in the portion of the hydrant above the frost line. No water is drained off below ground. The key to this design is a rubber-lined riser-spout. Inside the riser-spout, for the entire length of the hydrant to well below the frost line, is a rubber tube. When the valve is opened, the water flows through this tube. With the water pressure turned on, the rubber tube expands against the inside of the riser-spout, allowing a full column of water to flow. As soon as the water pressure is turned off, the rubber tubing, which is installed under tension, contracts to an internal diameter not much greater than the thickness of a lead pencil. In cold weather the thin column of water inside of the tube freezes down to the frost line. Whenever the valve is opened, water pressure again expands the tubing; and water flows up and around the "pencil" of ice. The ice breaks up and flushes out with the water, giving a free-flowing stream almost instantly.

Crushing Plant

A new secondary crushing, screening and loading plant is a recent product of the Universal Engineering Corporation, Cedar Rapids, Ia. A feature of this plant, exclusively Universal, is the 30 in. twin-dual roll crusher. This is a 2-stage reduction machine consisting of two double roll crushers mounted on a single set of shafts and bearings. One set of rolls receives the coarse material coming from the top deck of the screen and acts as a roughing crusher. Approximately 40-50% of the material that goes through this crusher will be crushed to finish size. The second set of rolls of larger diameter than the first, acts as a finishing machine set to reduce the crushed material to specification size. Other equipment includes a 4 ft. x 12 ft 2½ in. deck vibrating screen, three 30 in. conveyors, a 25 in. plate feeder, a rotovator (revolving elevator) and a heavy duty rubber-tired chassis. All principal drives are through V belts. The power unit is set at one side of the plant. Power is transmitted to the plant through Universal joints and a special roller-bearing jack shaft mounted on the main truck frame. The plant has a crushing capacity of 60-100 cu. yd. of minus 1 in. material per hour and requires 125 H.P. to operate.

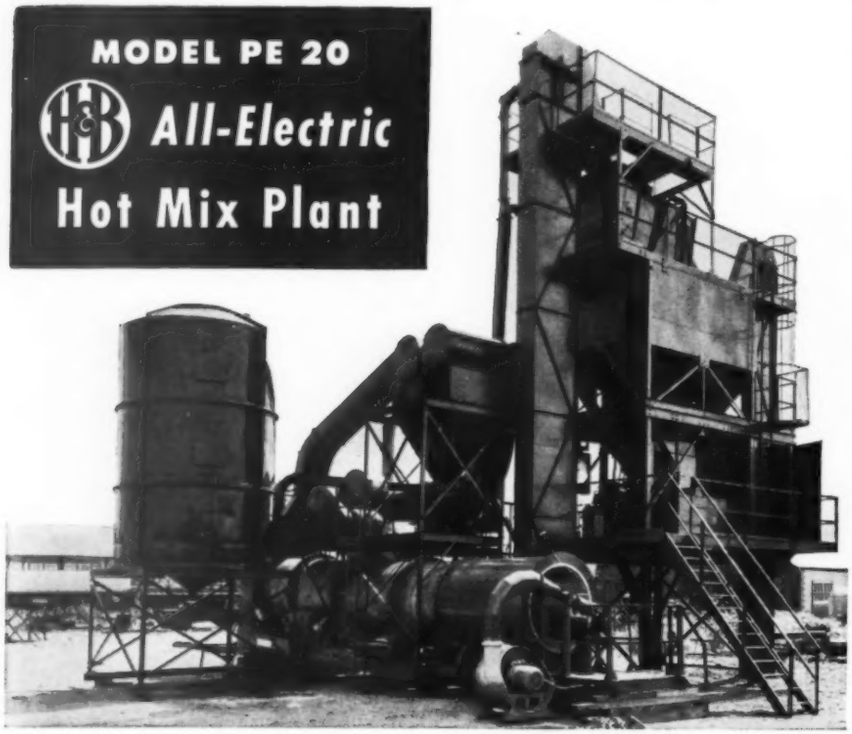
New Universal Crushing, Screening and Loading Plant

Cold Weather Engine Starting

A special patented quick-starting device, according to California Oil Co., overcomes cold weather difficulties of cold weather starting of Diesel and gasoline powered engines. This Chevron starting fluid is a product of the California Research Corporation. Its present method of packaging and application was developed by the California Oil Co. Both of these companies are wholly-owned subsidiaries of the Standard Oil Co. of California, Standard Oil Bldg., San Francisco, Calif. Basically an ethyl-ether compound, its use has been simplified by packing the fluid in gelatine capsules. These capsules come in two sizes, 17 cc. and 7 cc. The capsules are used with a special puncturing tool and priming system, injecting the fluid into the intake manifold. Packaging the fluid in easy-to-use capsules insures safe handling. The fluid flows at 70° F below zero. Additives in the starting fluid lubricate as the engine is started. The fluid will not corrode metal parts.

MODEL PE 20

H&B All-Electric Hot Mix Plant



A Sectional Type Plant . . .

With Stationary Plant Efficiency

THE MOTO-PAVER

A self-contained, self-propelled machine which accomplishes the complete mixing and laying job in one continuous operation, using gravel, stone or slag aggregates and most types of emulsions, asphalts and tars. Particularly adapted for resurfacing jobs on county roads and city streets.

Although the Hetherington & Berner Model PE is a sectional type plant and can therefore be moved, it retains all the features of a stationary plant that make for dependable and efficient production.

PE plants are electrically driven. All motors and controls are furnished and installed, and the plants are completely wired at the factory before shipment. Optional with this type of plant is equipment for steam dispersion, fugitive dust collection, low pressure oil burning and dust handling. Write for Bulletin P-46 which gives specifications and complete information.

HETHERINGTON & BERNER INC.

721 Kentucky Ave., Indianapolis 7, Ind.

H&B Builds Portable and Stationary Asphalt Plants of All Types, Sizes and Capacities

Hand Level

A new improved hand level developed by the Brunson Instrument Co., 1405 Walnut St., Kansas City 6, Mo., is claimed to expedite the making of preliminary and construction surveys. New features include the incorporation of the level vial inside the instrument to eliminate the usual inconvenient protrusion.

New Brunson Hand Level

Adjustment of the instrument is pre-set and maintained by spring tension regardless of rough handling. The prism and lens are mounted in a sturdy, one-piece frame, preventing any change of adjustment due to movement of these parts. The level is delivered complete in a handsome leather case with belt loop, yet it is sturdy and light enough to carry easily in a shirt pocket.

Automatic Brake for Winch

An automatic brake is now available as optional equipment for the D6N towing winch, according to the Hyster Co., Portland, Ore. Simple in design, quick and positive in action, this brake is of the same general type as the automatic brakes used with the D8N, D8L, and D7N towing winches. The brake lever is set before winching so that when the drum stops winding, the brake automatically engages, thereby holding the load in place. Since the single pawl or dog carried by the revolving arm, is retractable, it does not click against the ratchet teeth in the rim with resultant noise and wear.

Model View of Hyster Automatic Brake

By eliminating the necessity for instantaneous coordination when setting the brake and releasing the clutch, operation is stated to be much simplified for the driver. Excessive shock to the main line is also reduced, giving longer cable life.

Light and Signal Flare

A new, combination emergency light and signal flare has been introduced by the U-C Lite Manufacturing Co., 1056 West Hubbard St., Chicago, Ill. It is durably made with a rustproof and weatherproof baked enamel steel container for the two standard dry-cell lantern batteries and connections. A double-throw, single pole switch gives instant selection of either the steady light or the flashing flare with 100-112 flashes per minte. The light is stated to be visible in all directions for over 600 ft. The ordinary burning life of the batteries is said to give continuous flashing for 28 hours or a steady light for 20 hours. In intermittent use the life of the batteries will be longer. Two independent bulbs are used for light. In the event that one burns out, the other continues to operate. A third bulb in a dummy socket a little below the others is a spare that is always readily available in case of a burnout.

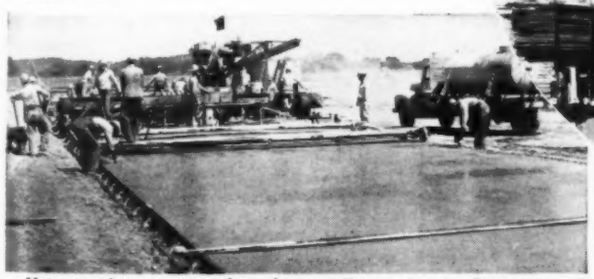
Big Beam 400-F Flare

Mechanical Dowel AND TIE-BAR INSTALLER

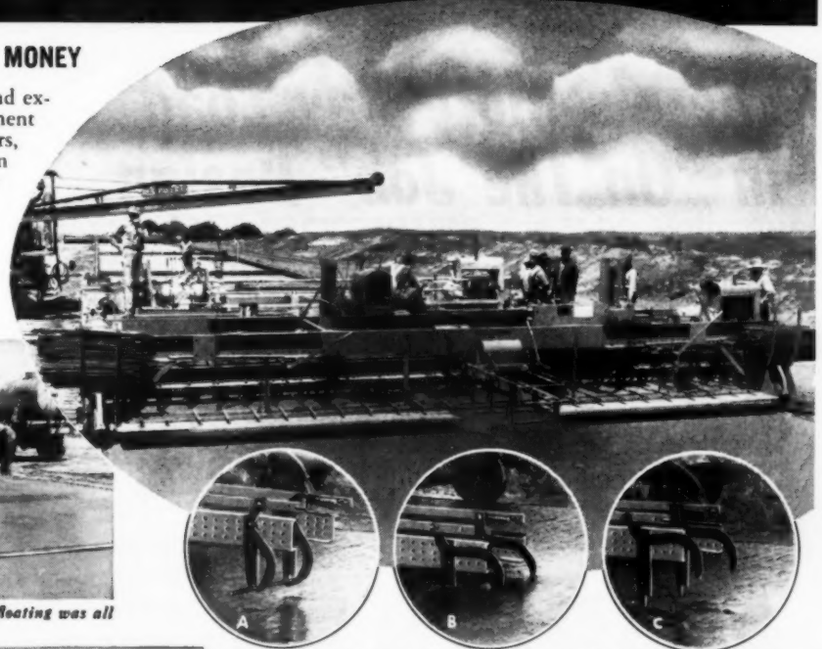
AIRPORT CONTRACTORS—SAVE TIME AND MONEY

You eliminate stakes, complicated holding harness and expensive hand labor, and are assured of perfect alignment with this Flex-Plane installer. Job tested for three years, this machine has demonstrated substantial savings in time and money. Let us tell you how—write today to Flex-Plane, Warren, Ohio, for Bulletin J-105.

- ADJUSTABLE TO VARIOUS DOWEL SPACINGS
- ADJUSTABLE TO VARIOUS PAVEMENT WIDTHS
- INSTALLS IN EXACT POSITION AND ALIGNMENT
- CUTS JOINTS



Note smooth pavement surface after installation. Regular floating was all that was required.



A. Bar gripped by mechanical fingers ready for vibrated insertion into plastic concrete. Tie-bars and dowels easily insert into fingers.

B. Bar has been worked, by vibration, to pre-determined depth. Rear holding finger was disengaged as bar started through concrete.

C. Completed operation. Vibrated removal of fingers assures complete seal of plastic concrete. Surface disturbance is minor.

FLEX-PLANE
WARREN OHIO
(FLEXIBLE ROAD JOINT MACHINE COMPANY)

Crane

Coles cranes, an English product, are now available in the United States through an American organization, Coles Cranes, Inc., 4316 South Paulina St., Chicago 9, Ill., which will have complete facilities for sales and services through leading distributors throughout this country. Model 8502 (as illustrated) is one of the several models, a 7½-ton, powered by a Ford V-8, 47 HP, gasoline engine. It has a turning cycle of 40 ft. and will travel at 2 mph loaded and 4 mph unloaded on level ground. The crane has four motions: hoisting, swinging derricking and traveling—each operated by separate single motors. All can be operated simultaneously. The crane travels on four pneumatic-tired wheels, steering being controlled from the driver's seat of the revolving superstructure. An unobstructed view in all directions may

Model 8502 7½ Ton Cole Crane

be had from the cab. Brakes are electromagnetic, automatically applied in hoist, boom-hoist and swing. Hydraulic brakes in the rear wheels are operated by lever or pedal. All Cole cranes are equipped with automatic safe-load indicators. Ample stability through full 360° swing of superstructure and a maximum load can be lifted at any point of swing. There is a choice of models from 1½ ton to 15-ton capacities. Both 7½- and 15-ton models also are available motor truck mounted.

Paving Breaker

A new 70 lb. pneumatic paving breaker has been announced by the Independent Pneumatic Tool Co., Aurora, Ill. The new Thor "24" paving breaker is a companion

Thor "24" Paving Breaker

machine to the Thor 84 lb. breaker, the Model "25." The new Thor breaker has a 28 in. overall length; 1½ in. x 6 in. (1⅛ in. x 6 in. optional) chuck sizes for collared steels; ¾ in. hose size; and ¾ in. hose inlet pipe thread.

Front-End Loader

A new front-end loader for attachment to graders and maintainers has been announced by Meili-Blumberg Corp., New Holstein, Wis. The design is also said to be such as to permit installation on all M-B graders and maintainers already in operation. The operation of the loader is independent of the grader blade, scarifier or leaning wheels. The loader

Front—End Loader Attached to M-B Grader

Model Illustrated: Standard 3 cu. yd. contractors body with running boards, side braces and half-roll cab protector. Mounted over Marion model 721A hoist.

There's More Pay Load in "On The Job" Design

Extra pounds on every trip . . . faster loading and unloading . . . fewer lay-ups in the repair shop . . . longer service life under the toughest hauling conditions. These extra-profit features are built into every Marion unit by engineers who study special hauling problems right *on the job*. Ask your nearest Marion Distributor about a Marion Body and Hoist designed under the actual working conditions you face. Or write direct.

MARION
DUMP BODIES and HYDRAULIC HOISTS

GET MORE DETAILS NOW
Just mail a post card or letter for the complete Marion catalog, or ask your Marion Distributor.

MARION METAL PRODUCTS CO., MARION, OHIO

is equipped with a standard ½ yd. bucket for handling dirt, sand, gravel and materials of this type. A 1-yd. bucket is available for handling snow and other light bulky materials of the same classification. The bucket when in dumping position has a clearance of 8 ft. 6 in. for easy loading of even the highest dump trucks. A single lever at the operator's seat provides complete remote control of the digging pitch, raising, leveling, dumping, shaking and lowering of the bucket. Mounting of the loader, after the original installation, requires only about 30 minutes.

New High Speed Concrete Joint Cleaning Machine

A welcome labor-saver and job expediter is announced by G. H. Tennant Co. (Est. 1870), 2530 North 2nd street, Minneapolis 11, Minn.

The accompanying photo shows engineers using this new machine—the Tennant Concrete Grooving Machine—to clean and regroove joints at Kansas City's Grandview Municipal Airport.

Eliminating difficult and slow work with picks, the machine rapidly removes old seal and cuts a clean, correctly-profiled groove that forms a tight bond with new seal.

The machine has self-propelling action and is operated by one man. The fast cleaning and cutting effect results from a series of 4-in. tool steel cutters mounted on a heavy duty cutter head that revolves at about 2400 RPM. The unit is powered by a 13.3 h.p. air-cooled gasoline engine, equipped with oil bath air cleaner, self-starter, generator, and storage battery.

Forward rotation of the cutter head and load-balance on two supporting wheels make the machine easy to guide and control. Width of cut, from ⅜ to 2¼ in., is readily controlled by changing the spacing of the cutters; depth of cut is controlled by operator (maximum depth 1¼ in.).

Tennant Joint Cleaner

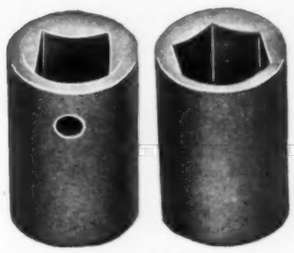
To aid production the machine is usually supplied with an extra cutter head (installed in 2 minutes) so worn cutters can be replaced without holding up the machine. In the above photo at Grandview Municipal Airport, Kansas City, Mo., approximately 360,000 lin. ft. of concrete joints were mechanically cleaned with the machine in preparation for resealing.

Capacity of the new unit, as reported by highway and airport engineers, apparently varies from about 5,000 to 20,000 ft. per day. Speed on any installation depends chiefly on the type of concrete, size and condition of joints, width and depth desired cut, local traffic conditions, and on the individual skill of the operator.

Manufacturer is the 79-year-old G. H. Tennant Company of Minneapolis, engineers and builders of heavy duty machines for cleaning and maintenance of industrial floors, roofs, decks, etc. The firm has offices in principal U.S. cities and Canada.

Impact Socket

A new departure in impact sockets, introduced by Owatonna Tool Co., 319 Cedar St., Owatonna, Minn., is claimed to provide forged power sockets that stand up longer and give better service. Comparatively thin-walled with hexagon openings that will take the abuse of assembly line production. Built-in strength and toughness with a high safety factor and maximum clearance are features of these new OTC Sockets that will appeal to all users of power wrenches. ½-in. square drive. Made in 13 sizes with 7/16 in. to 1¼ in. openings.



Impact Socket

Photo Courtesy Champion Coal Co., Pittsburgh

NEW *EAGLE* LOADER HANDLES 5 YARDS PER MINUTE EASILY

Officials at Champion are pleased with performance of this Eagle Model 400 Loader. One man operated, moves from job to job at highway speeds—handles any loose material: dirt, cinders, coal, snow, gravel, sand, etc.

Write for more information, Dept. A

EAGLE

JAW CRUSHERS · IMPACT BREAKERS
PULVERIZERS · CONVEYORS · LOADERS

CRUSHER CO., *Inc.* GALION OHIO·U·S·A

OTC

MASTER SERIES HEAVY DUTY BOX WRENCHES

for DEPENDABILITY

Do it easier, faster, with OTC BOX WRENCHES. They combine light weight with great strength and sure grip. 12-point accurately broached openings prevent slipping, spreading or twisting of wrench. Improved handle stop and positive safety locking feature eliminate chance of handle turning on stub end of wrench, or slipping off.

Complete range of sizes—⅞" to 3⅛"—Seamless Steel Tubular Handles—3 sizes fit all 60 different wrench heads.

Ask nearest OTC Distributor or write for Industrial Maintenance Bulletin PE-1946.

Look for This Sign

AUTHORIZED DISTRIBUTOR OTC MAINTENANCE TOOLS

OWATONNA TOOL CO.

319 Cedar St. Owatonna, Minn.

KINNEY THE WORLD'S FIRST BITUMINOUS DISTRIBUTOR

For nearly forty years, Kinney Distributors have been applying bitumen safely, accurately, and dependably. From the first horse-drawn unit to the new 1949 models, Kinney machines have featured the most improved design. The heart of the distributor — the Kinney Rotating Plunger Pump — handles oils, tars, asphalts and emulsions with the accuracy of a meter. The complete Kinney Distributor, including pumping engine, heating system, tank, spray equipment and controls is built for rugged service and long life. Highway departments and private contractors everywhere rely on Kinney Distributors for building and maintaining the highways and airports of the world.

Write for Bulletin A-48

KINNEY MANUFACTURING COMPANY

3537 WASHINGTON STREET, BOSTON 30, MASS.

New York • Chicago • Philadelphia • Los Angeles • San Francisco

We also manufacture Liquid Pumps, Vacuum Pumps and Clutches

Portable Hardness Tester

A new portable hardness tester for Rockwell readings has been announced by Riehle Testing Machines Division, American Machine and Metals, Inc., East Moline, Ill. This instrument weighs only 3 lb. 6 oz. and comes in a convenient carrying case. The portable hardness tester is stated to be comparable in accuracy to bench type testers, yet costs less than half as much. Further information and prices available from the manufacturer.

New Mine Trolley Wire Guard

Buronik trolley wire guard, a patented Flexlastics flame-proof and high voltage resistant protection against the hazards of poorly protected trolley wires at crossovers and loading stations in mines, is featured in an interesting bulletin issued by Raybestos-Manhattan, Inc., Manhattan Rubber Division, Passaic, N.J. The bulletin describing the Buronik construction, which has been officially approved by Departments of Mines of several principal coal producing states, may be obtained from the manufacturer by requesting Bulletin 6902. Ten advantages gained through the use of the guard, construction details and diagrams for installation are included in the bulletin.

Diesel Engine Lubricant

A new Diesel engine lubricant, designed to counteract the harmful effect of high sulfur fuels, has been developed by the D-A Lubricant Co., Inc., Indianapolis, Ind. The new product, D-A "Extra-Treated" diesel oil, is an additive-type lubricant designed for use in high-speed diesel engines. Its development is based on results obtained from full scale laboratory engine tests and field performance records. Owners of certain type diesel engines operating on diesel fuels with a sulfur content in excess of 0.5 per cent have been confronted with the problem of engine sludge resulting in stuck rings plus a high rate of liner wear. It is claimed the use of D-A "Extra-Treated" diesel oil will eliminate these sludging and wear conditions. D-A engineers point out that new D-A "Extra-Treated" diesel oil is recommended only for use with high sulfur content diesel fuels.

MANUFACTURERS' LITERATURE

New Broadside Gives Data On Self-Loading Dirtmover

Information on the new D Roadster Tournapull, one-man operated, self-loading dirtmover, is contained in a new D Roadster literature Broadside.

Profusely illustrated, the broadside carries complete specifications on this new 9-ton tool, and lists and illustrates features which make it a profitable machine on a wide variety of jobs. These include its positive-ejection Scraper, travel speeds up to 25 m.p.h. all-weather torque-proportioning differential, 2-speed positive power steer, electric control and 4-wheel air brakes.

The broadside points out the D Roadster's usefulness in road maintenance, on materials handling jobs, leveling of plant

and subdivision sites and on a wide variety of railroad, airport, levee and logging applications.

A copy of this D Roadster Broadside, TP-189, may be obtained from any LeTourneau Distributor, or from R. G. LeTourneau, Inc., Peoria, Illinois.

Scraper

Information on the new D Roadster Tournapull, one-man operated, self-loading dirtmover, is contained in a new D Roadster literature broadside (TP-189) issued by R. G. LeTourneau, Inc., Peoria, Ill. Profusely illustrated, the broadside carries complete specifications on this new 9-ton tool, and lists and illustrates features which make it a profitable machine on a wide variety of jobs. These include its positive-ejection scraper, travel speeds up to 25 m.p.h., all-weather torque-proportioning differential, 2-speed positive power steer, electric control and 4-wheel air brakes.

Crane

Complete specifications for the New Clyde Handi-Crane are contained in a circular issued by Clyde Iron Works, Inc., Duluth 1, Minn. This crane is mounted on a Model UTI, Minneapolis-Moline tractor and can pick up a load and carry it wherever a tractor can go. It has a high lifting capacity of 4 tons and has exceptionally easy steering due to its special steering gear with roller bearing knuckles. It revolves 320 degrees.

Timber Structures

The 1949 edition of "Typical Designs of Timber Structures," a reference for use of architects and engineers, has just been published by the Timber Engineering Co. Containing 88 new, typical designs and valuable technical data with illustrations, this 116-page book is believed to be the most complete of its kind ever published. Modern methods of timber construction using Teco timber connectors are well illustrated by sample designs for use by architects and engineers in preparing their own economical timber designs, and by typical on-the-job photographs showing designs of these types in use. "Typical Designs of Timber Structures," priced at $10, will be distributed as complimentary while the supply lasts to practicing architects and engineers who write for copy on their firm letterhead to Timber Engineering Co., 1319—18th St., N.W., Washington 6, D.C.

Tractor

A new publication of Caterpillar Tractor Co., Peoria, Ill., presents the design features and range of applications of the company's 32-hp track-type tractor. Profusely illustrated and graphic in content, the booklet portrays the engineering of the product, its manufacture and it application in a wide range of chores to which it is put by users.

Cranes

A new 16-page bulletin entitled "Self-Propelled Cranes," released by The Thew Shovel Co., Lorain, O., illustrates 48 of the various applications of self-propelled cranes for industrial material handling and construction operations. Lorain self-propelled cranes are single-engine, one-man operated cranes, with four speeds in either direction. It travels to all parts of the job at speeds up to 7 m.p.h. A selection of wide-track and standard-width machines are offered in the self-propelled models. This new bulletin illustrates many fields in which self-propelled machines are now serving.

Curing Concrete

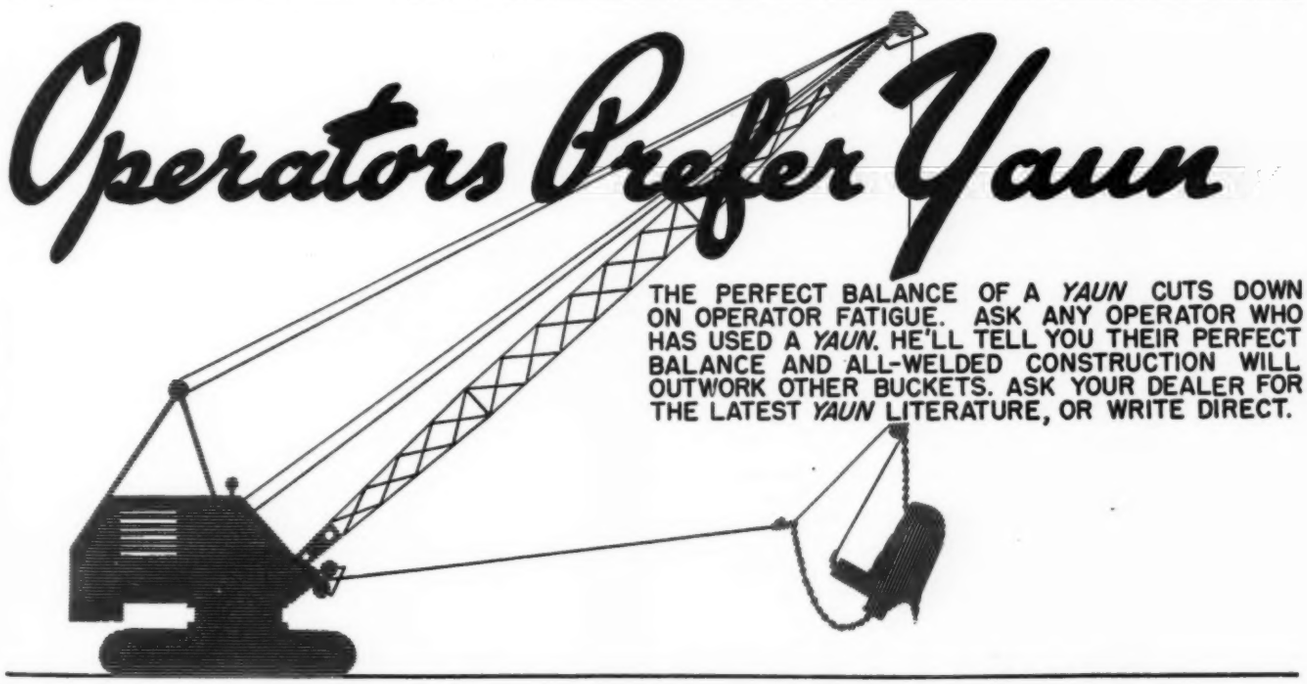
The Sisalkraft method of curing and protection is featured in a brochure issued by The Sisalkraft Co., 205 W. Wacker Drive, Chicago 6, Ill. Two methods of using sisalkraft are illustrated and described. One method used supplemental "stringer sheets" to cover edges. Method two eliminates the supplemented "stringer sheets." Blankets are manufactured the same width as the slab and are shipped complete on timbers. Results of tests of the protection against frost by sisalkraft are given. An interesting feature is a photograph of sisalkraft after 15 re-uses.

Crane and Excavator

Mobility and versatility of the Byers Traveler, Model 61W, ½ cu. yd., and Model 71W, ⅝ cu. yd., excavators and cranes, are illustrated in a new catalog issued by The Byers Machine Co., Ravenna, O. This 24-page catalog also shows the adaptability of the rubber-tired Traveler to either construction work or a factory materials handling job. Using both photographs and line drawings, the more important mechanical features of the operating machinery are also described.

Concrete Improver

A new circular on Portite issued by Hopper Products, Inc., 12 East 41st St., New York 17, N.Y., describes its applica-


Operators Prefer Yaun
THE PERFECT BALANCE OF A YAUN CUTS DOWN ON OPERATOR FATIGUE. ASK ANY OPERATOR WHO HAS USED A YAUN. HE'LL TELL YOU THEIR PERFECT BALANCE AND ALL-WELDED CONSTRUCTION WILL OUTWORK OTHER BUCKETS. ASK YOUR DEALER FOR THE LATEST YAUN LITERATURE, OR WRITE DIRECT.

YAUN DRAGLINE BUCKETS AND MFG. PLANT
BATON ROUGE, LA.

Another POWER Achievement

a New WISCONSIN HEAVY-DUTY Air-Cooled ENGINE

Lower cost, more horsepower at normal speeds . . . less weight! Already, manufacturers and users alike are praising these features of the new heavy-duty air-cooled Model AEN 7½ hp. single-cylinder engine.

As shown, it develops peak horsepower well within normal speeds, yet weighs only 126 pounds . . . less than any comparable engine.

Advanced engineering design alone is responsible for the added power, decreased weight and lower cost per delivered horsepower. Every part is machined to traditional close tolerances. Every service-proved, heavy-duty feature still remains . . . Timken tapered roller-bearings at both ends of the crankshaft; jet and spray oiling, etc.

Write today for additional data. Other Wisconsin Air-Cooled Engines available in Single Cylinder, 2-Cylinder and 4-Cylinder Models, 2 to 30 hp.

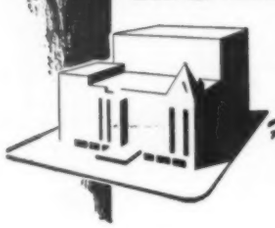
WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 14, WISCONSIN

COMING TO
CLEVELAND

NEW
VISIT THE HOLLENDEN...
COMPLETELY REDECORATED

★ 1000 rooms with bath
★ Radio in every room
★ Six fine restaurants
★ Central downtown location
★ Garage attached

HOTEL HOLLENDEN



ROBERT P. JOYCE
GENERAL MANAGER

Home of the famous Vogue Room

tions and discusses laboratory and field findings that may be of use in designing better concrete, cement plaster and mortar. Portite is a long-chain, high-molecular, neutral compound in aqueous solution. It is a controllable air entraining agent; a wetting and dispersing agent; and a promoter of cement hydration.

WITH THE MANUFACTURERS & DISTRIBUTORS

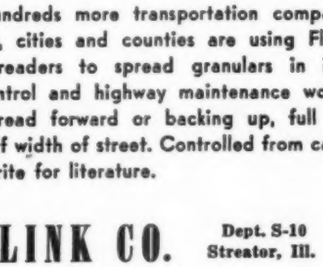
Kinney Opens Branch Office

Kinney Manufacturing Co., Boston, Mass., manufacturer of liquid pumps, vacuum pumps, clutches and bituminous distributors, announces the opening on January 3, 1949, of a branch office at Cleveland, Ohio. The new office is located at 202 Plymouth Bldg., 2036 E. 22nd St., Cleveland 15, O. William B. Mills, formerly of the Boston office and more recently located in Chicago, is manager. The territory covered by the Cleveland office will be Ohio, Kentucky, West Virginia, North Western Pennsylvania and Western New York to Rochester.

Mack Truck Appointments

A. C. Fetzer, Mack Truck vice-president and general sales manager, has announced the following appointments: J. E. Donovan has been made district manager in charge of the San Francisco Branch, with headquarters at 1745 Folsom St. J. W. Biggins has been appointed district manager in charge of the Louisville Branch, located at 225 East Walnut St. H. J. Fikejs has become district manager in charge of the Kansas City Branch, with offices at 2605 Warwick Blvd. T. J. Colter has been named district manager in charge of the Milwaukee Branch, 3701 W. Lisbon Ave. A. P. Cowles has been appointed district manager in charge of the Springfield (Mass.)

FLINK SPREADERS



Unquestionably the finest hydraulic spreader.

Hundreds more transportation companies, cities and counties are using Flink Spreaders to spread granulars in ice control and highway maintenance work. Spread forward or backing up, full or half width of street. Controlled from cab. Write for literature.

FLINK CO. Dept. S-10 Streator, Ill.

Branch, with headquarters at 18 Osborne Terrace. R. J. McGivney has been made district manager in charge of the Worcester (Mass.) Branch, located at 306 Belmont St.

Hawkins Made Division Sales Manager

W. S. Hawkins

William S. Hawkins has been appointed division sales manager for The Osgood Co., and The General Excavator Co., Marion, O. His headquarters will be at Topeka, Kan., and his division covers the states of Texas, Oklahoma, Kansas, Missouri, and part of Iowa. Hawkins, who is 31 years old, joined the general excavator as a draftsman in the Engineering Department soon after leaving school. During the war he served in the European Theatre as a Technical Sgt. in the Air Corps. He resumed his duties in the Engineering Department of The General Excavator Co. when discharged from the Air Corps. He came to the Osgood General sales force in July, of 1948, where he underwent an intensive training course in the Osgood and General shops, sales and service departments.

Oeschle Transferred to Harrison, N. J.

C. F. Oechsle

Carl F. Oechsle, assistant vice president and manager of the Construction Equipment Department of Worthington Pump and Machinery Corporation, has been transferred to Harrison, N. J., and will make his headquarters at the executive offices in that city. W. J. Fleming, manager of the Holyoke Construction Equipment Sales Division, will continue to make his headquarters at Holyoke, Mass., and W. F. Lockhardt, manager of the Ransome Construction Equipment Sales Division, will remain at Dunellen, N. J. The corporation also announces a change in the Washington, D. C., personnel, with J. S. Dachman as Construction Equipment Regional Supervisor, succeeding H. C. Sargent. Additional regional supervisors for construction equipment sales have been set up in Atlanta, Ga., and Tulsa, Okla., with R. F. Litaker assigned to the post in Atlanta, and R. G. Barz at Tulsa.

Heads Physical Research Department

Dr. William Lee Davidson, an international authority on atomic energy, has been named director of The B. F. Goodrich Company's physical research department. Dr. Davidson has been with B. F. Goodrich since 1940. He went to the government atomic energy project in Oak Ridge, Tenn. in 1947, and returned to Ohio before the new B. F. Goodrich Research Center at Brecksville, O., began operation in June, 1948.

New President for Hill Diesel

Alexander B. Zeitlin has been elected president and a member of the board of directors of the Hill Diesel Engine Corporation, of Lansing, Mich., manufacturers of industrial and marine Diesel engines, and electric generating sets. Mr. Zeitlin also is vice-president and director of Drake America Corporation, 20 E. 50th St., New York, N. Y., export-import concern. Hill will continue, under the direction of Joseph A. Archer, general manager, to manufacture the small Diesel engines, the 2-, 4-, and 6-cylinder model "R" series (ranging up to approximately 60 hp). All sales of Hill products, both in this country and abroad, will be handled by the affiliated Drake America Corporation of New York, through its Hill Diesel Engine Division.

Fairbanks-Morse Changes

A series of promotions and changes in the Sales Division of Fairbanks, Morse & Co., Chicago, Ill., recently announced include: O. O. Lewis, until a short time ago assistant sales manager, has been promoted to sales manager. Harry L. Hilleary, for the past 17 years manager of the firm's St. Louis, Mo., branch, is being transferred to the company's headquarters office in Chicago. He has been promoted to the position of assistant sales manager. L. A. Weom, manager of the Pump Division, has been transferred to St. Louis to become branch house manager, succeeding Mr. Hilleary. Donald T. Johnstone, assistant manager of the Pump Division, succeeds Mr. Weom as manager of the corporation's Pump Division with offices in Chicago.

MILES OF SHOULDER

Easy and Fast with Standard Steel "S-J"

Handles ALL TYPES OF BITUMINOUS MATERIAL WITH EFFICIENCY — ROLLS WITH SPEED FROM JOB TO JOB — MORE MILES OF WORK PER DAY

Raveling shoulders, chuck holes, surface cracks and all other road breaks quickly run into heavier and more costly damage under heavy day after day traffic. The Standard Steel "S-J" can be used with equal success on emergency spot jobs as on "miles of shoulder" or laying driveways, school grounds or any other secondary construction. A thoroughly dependable "S-J" will save money and do a top grade job in fast time on many jobs that are in the "big equipment class". Get the facts on "S-J" before you consider any other type of similar equipment.

WRITE FOR CATALOG "S-J"

OTHER PRODUCTS

Asphalt Pressure Distributors, Tar Kettles, Patch Rollers, Supply Tanks, Tool Heaters, Asphalt Tools, Street Flushers, Construction Brooms.

Built to the Highest Standard

SJ-1

Standard Steel Works

THEY

Roll Along

on ROGERS TRAILERS

Everyday Everywhere

MORE AND BIGGER LOADS

An impressive number of the biggest contractors TODAY repeatedly put their confidence in ROGERS TRAILERS long proven ability to "deliver the goods" and "stand the gaff" over long periods of heavy usage.

Smaller operators, too, find in the extensive ROGERS LINE, the answer to their particular trailer requirements with proper capacity, road clearance, type of construction and strength with lightness.

We solicit inquiries which make your trailer problems our problems and we generally come up with the correct answer.

ROGERS HEAVY DUTY Gooseneck Trailers

ROGERS BROTHERS CORPORATION

DESIGNERS and BUILDERS of HEAVY DUTY TRAILERS

SINCE 1915

110 Orchard St., Albion, Penna.

THE SAUERMAN WAY

The ¾ cu. yd. Sauerman Power Scraper pictured above keeps screening plant supplied with material that it scoops out of a wide bank of gravel. Cost is about 6c per cubic yard of gravel handled.

Time and labor are saved by using a Sauerman Scraper and combining digging, hauling and dumping in a continuous process with one operator. Rapid handling at minimum cost. Crescent bottomless bucket—exclusive feature of Sauerman Scraper machines—digs and hauls large loads faster and with less line-pull than any other scraper. It works in any kind of dry ground or under water. Renewable digging lip absorbs most of the wear, adds many years to useful life of bucket.

Sauerman Crescent Scraper Bucket

Sizes: ½ cu. yd. to 15 cu. yd.

Streamline shape makes faster digging possible with less power.

Write for Catalog

SAUERMAN BROS., Inc.

588 S. Clinton St. Chicago 7, Illinois

Gar Wood Appointments

N. A. Jorgensen has been appointed regional manager of the Northeast region for Gar Wood Industries, Inc., Wayne, Mich. W. E. Toensing has been appointed

W. E. Toensing

N. A. Jorgensen

district manager for Virginia, North Carolina, South Carolina and the District of Columbia. Prior to his new appointment Mr. Jorgensen was manager of the New York Branch of Gar Wood Industries, Inc. Mr. Toensing was formerly service manager for the St. Paul Division, Minneapolis, Minn.

Miller Appointed to New Post

Jay E. Miller has been appointed to a newly-created post, western public relations manager for The B. F. Goodrich Co. His headquarters will be in the company's west coast plant at 5400 E. Olympic Blvd., Los Angeles. Miller, with the company 13 years, goes to his new post after serving for the last 18 months as advertising and sales promotion manager of the Associated Lines sales division. He had previously been manager of advertising and sales promotion in the Industrial Products division, since 1943, and also held the same post in the sundries department five years.

S.O. of Calif. Consolidates

The Standard Oil Co. of California has consolidated western asphalt business and that of its subsidiaries. The expanded operations will be carried on by a new company to be known as "Stancal Asphalt & Bitumuls Co." Home office will be at 200 Bush St., San Francisco. "Stancal" will embrace the former California Asphalt Corporation whose refinery is in Portland, Ore.; the Asphalt Division of the Standard of California; and the western portion of the American Bitumuls Co. with plants at Oakland and Los Angeles, Calif., and Tucson, Ariz. C. W. Stewart will be president of Stancal, and N. H. Angell, vice-president in charge of sales. The new company will market bitumuls and Laykold emulsified asphalt, paving asphalt, cutback asphalts and road oils in the territory west of the Rocky Mountains. The American Bitumuls Co. will continue to operate East of the Rockies, as a subsidiary.

Syntron Promotions

Establishment of several new district sales offices and promotion of sales personnel have been announced by Syntron Co., Homer City, Pa. W. C. Leasure of the company's general offices in Homer City has been promoted to district sales manager in charge of the new sales office in Houston Tex. Nelson C. DeVilling, formerly of the Pittsburgh sales office, has been promoted to district sales manager of the new sales office in Dallas, Tex. Dick McHale of the company's Chicago office has been promoted to district

More Dirt Moves Faster When
OWEN BUCKETS
swing over dump trucks

This claim is strongly substantiated by the increasing numbers of excavating contractors who have standardized on Owen Buckets to "Insure a Bigger Day's Work".

Long popular, Owen design and construction characteristics make for consistent "ease of operation" with "A Mouthful at Every Bite" and a clean and rapid discharge.

A MOUTHFUL AT EVERY BITE

THE OWEN BUCKET CO. 6070 Breakwater Ave., Cleveland, O.

BRANCHES: PHILADELPHIA • CHICAGO • BERKELEY, CALIF.

sales manager of the Los Angeles office. James B. Barth has been appointed to replace Mr. DeVilling on the staff of the Pittsburgh sales force and G. R. Stocum is taking over Mr. McHale's duties in the Chicago sales office. D. E. Nugent has been appointed to take over power tools sales in the Kansas City, Mo., office.

Flasco Promoted by General Tire

James J. Flasco of Kansas City, Mo., a veteran of 23 years in the tire industry, has taken over as St. Louis branch sales manager for the General Tire & Rubber Co., Akron, O. Frank Sibley has been transferred from the St. Louis post to one in truck tire sales in the metropolitan Chicago branch area.

Holmes Promoted by Koppers

R. R. Holmes, sales manager of the Tar Products Division of Koppers Company, Inc., Pittsburgh, Pa., since October, 1947, has been appointed assistant general manager of that division. In November, 1923, Mr. Holmes joined Koppers Co. in the accounting department. In 1944, after serving as a clerk and a department manager, he was made manager of the Koppers White Tar Division at Kearny, N.J. He returned to Pittsburgh in October, 1947, to become sales manager of the Tar Products Division. In his new position, Mr. Holmes will assist J. N. Forker, vice president and general manager, in guiding the policies and the operations of the entire division, which operates 21 plants in 16 states.

Donovan Promoted by Mack

J. E. Donovan

J. E. Donovan has been appointed manager of the San Francisco Branch of Mack Trucks, Inc., New York, N. Y. In assuming direction of one of the largest of Mack's 67 direct factory branches, Mr. Donovan climaxes a 25-year period of service with the company. During this time he held various positions, the last being that of special sales representative in charge of national and fleet owner accounts in

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Save it with the
FOOTE KINETIC ASPHALT MIXER

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- 3 cu. ft. in 30 seconds.
- High output for low investment.
- Handles any cold mix without auxiliary equipment. Can handle Hot mixes in conjunction with kettles.
- Fully portable.
- New mixing principle thoroughly coats every particle of aggregate. Gives you 8 to 10 more batches out of every barrel of asphalt.

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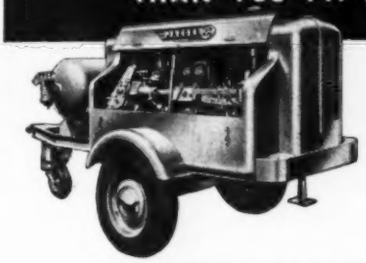
THE FOOTE CO., INC.
Subsidiary of Blaw-Knox Co.
1936 State St., Nunda, N. Y.

the FOOTE Kinetic mixer
A BLAW-KNOX PRODUCT

NEW JAEGER 125 FT. COMPRESSOR
DOES 40% MORE WORK
THAN 105 FT. MACHINES



Runs 2 Heavy Breakers or 3 Medium Breakers at Full Pressure of 90 Pounds.

yet costs no more and uses no more fuel when not delivering more air

all other new sizes are comparable:

Jaeger's "new standards" are 75 cfm instead of 60 — 185 cfm instead of 160 — 250 cfm instead of 210 — 365 cfm instead of 315 — 600 cfm instead of 500 — to match the requirements of today's air tools, run more tools at full pressure and efficiency, *do 30% to 40% more work for the same money.* See your Jaeger distributor or get new Catalog JC-8.

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LOS ANGELES - - - CALIFORNIA

PORTABLE ASPHALT PLANTS
High Production—Low Cost

THE McCARTER IRON WORKS, INC.
NORRISTOWN, PENNA.

the San Francisco area. A native of California, Mr. Donovan is widely known in trucking circles throughout the state.

New Madsen Distributors

D. M. Ebberts, sales manager for Madsen Iron Works, Huntington Park, Calif., has announced the following distributors appointments for Madsen asphalt plants, Johnson float finishes, travel-mix-plants and a variety of aggregate handling equipment: Hunter Tractor and Machinery Co., 327 South 16th St., Milwaukee, Wis., for Wisconsin and Upper Michigan; Mott Haven Equipment, 211 East 149th St., New York for New York City and surrounding counties, and the Barrios Co., 227 International Trade Mart, New Orleans 12, La., for the Louisiana sales and service.

Ditch Enclosure Solves Problem of Storm Drainage and Irrigation Supply

(*Continued from page* 68)

in capacity. The accompanying photos snapped by the R & S editor show details of the trenching procedure and pipe installation, as carried out with dispatch by a crew of the Utah state road department. About one-half mile of 24-in. Armco corrugated metal pipe was installed, using a P & H pullshovel for trenching, an Allis-Chalmers industrial tractor with trailer for pipe delivery, a Caterpillar motor grader for backfilling and general shaping up, a Traxcavator loader for putting surplus dirt and refuse on trucks, and one or more general maintenance trucks for supply.

The street was then repaved full width for a distance of four blocks, the project including curb and gutter. Following is a tabulation of the estimated cost of the entire job:

24" x 2040' C.M.P.	4.25	$ 8,670.00
Com. Ex. 3,125 cu. yd.	.50	1,562.50
Gr. Gravel 4,375 tons	1.25	5,468.75
Bit. Mt. SC-3 16,250 gal.	.14	2,275.00
Bit. Mt. MC-4 3,750 gal.	.17	637.50
Scarifying & Mixing 4 mi.	2000	800.00
Cover Material 190 tons	4.00	760.00
		$20,173.75

The final surfacing will be Utah National Rock asphalt, mined adjacent to Vernal City.

VULCAN PAVEMENT AND CLAY DIGGING TOOLS

ARE MADE in a complete line of sizes to fit all standard compressed air hammers.

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VULCAN **TOOLS — THE WORLD OVER — NOTED FOR QUALITY AND DURABILITY"**

VULCAN TOOL MFG. CO.
QUINCY, MASS.

NAILS NAILS AND MORE NAILS

MOST ALL SIZES ON HAND
Atlas Nail Co., Inc.
Phone ANdover 3-3068
20 N Wacker Drive Chicago 6, Ill.
NOTE: WE WILL BUY YOUR SURPLUS NAILS

Shunk Snow Plow and Ice Removal BLADES

Proved record of superior performance. Made of specially developed steel to withstand severe service conditions.

FOR ALL TYPES AND MODELS OF SNOW PLOWS
Various widths, lengths, thicknesses--flat or curved--standard or special--punched ready to fit your machine.

SHUNK SAW-TOOTH ICE BLADE
Amazingly effective. Thoroughly breaks up and removes heavy, slippery ice and snow formations. Replaces all types of snow plow blades or maintenance units. Write for Bulletin and name of nearest Distributor.

Shunk
MANUFACTURING COMPANY
ESTABLISHED 1854
BUCYRUS, OHIO.

White

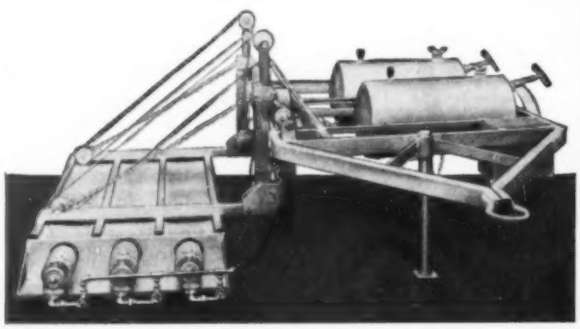
SURFACE HEATERS

Why destroy pavement base to apply new surface?

These heaters melt 1" of old asphalt in 5 minutes. New top can be placed without damaging base.

Sizes 6 x 6'; 3 x 6'

Write for Catalog.



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Immediate Delivery

1—Used Allis-Chalmers Model WM tractor equipped with Hough loader
1—Used Model L tractor with Baker bulldozer
1—Rebuilt Model HD10W tractor with Baker bulldozer
1—Slightly used F. W. D. Model HG truck w/Heil dump body—$5000.00
1—Used "Caterpillar" RD6 tractor
1—1947 White 20 truck w/ grain semi-trailer
1—12' Adams grader
1—"Caterpillar" 33 grader
1—M & M Model UT1 tractor w/ dual tires
1—New 4' Titan chain saw—$450.00
1—New Moorhead portable sand drier —$1325.00
1—Used Carco winch for Model HD7W tractor
1—Used Link-Belt Model 50 Shovel
1—Used trench hoe for Buckeye Model 70 Clipper
1—Used Allis-Chalmers Model HD 14 tractor w/cable angledozer
1—Used LeTourneau Model J8 scraper
1—Used Buckeye Model 70 dragline and shovel
1—Used Allis-Chalmers Model E-60 power unit
1—Used LeTourneau YR scraper
1—New Kwik-Mix 6-S concrete mixer
2—C.I.C. drag conveyors
1—Novo traffic line marker
1—New Novo standard pavement breaker
1—New Kwik-Mix 3½-S end discharge concrete mixer
1—Used Carco towing winch for Model HD14 tractor
Various size pumps, gas engines, rotary scrapers, and slip scrapers
1—Kwik-Mix 3½-S side discharge concrete mixer
1—Portable Repair Shop equipped w/Arc Welder, Air Compressor, 3 KW generator, front mounted winch w/10' portable boom, pipe vise, 4 retractable drop cords, 2 built-in work benches, completely enclosed van type body in which there is a gasoline heater for working in cold weather. Sides of the van open up which provides a work bench extending along both sides and rear of van. Entire unit mounted on General Motors 6 x 6 truck which has been driven less than 3000 miles.

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USED DREDGING AND SAND & GRAVEL PLANT

EQUIPMENT ON HAND

Write giving your needs

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FOR SALE

One (1) 34E Dual Drum Koehring Paver, completely overhauled—Serial No. 18643
One (1) Butler Car Scoop for unloading bulk cement, factory rebuilt—Serial No. CH106
Two (2) C. H. & E. No. 11 Triplex 3" Road Water Pumps.
200 Lin. Ft. Steel Face Forms for 9" Curb
One (1) 20' to 25' Type H Jaeger Finishing Machine
One (1) Complete Set of 30' Extensions for Type C Jaeger Finishing Machine including Screeds
Two (2) Butler V 36 Aggregate Bins, including Weighers
One (1) 20' to 25' Lakewood Pull Subgrader
One (1) AN D8 Single Power Control Unit
2500 Lin. Ft. Special 15" x 10" Heavy Duty Heltzel Steel Road Forms
All of the above equipment located in Milwaukee, price on application.

JOS. D. BONNESS, INC.
1409 N. 27th Street Milwaukee 8, Wis.
Phone West 3-2324

FOR SALE

1—N. W. Shovel, 2½ c.y., new Oct. 1946
1—N. W. Shovel, 1½ c.y., new April 1946
1—P & H Dragline, 1½ c.y., new June 1948
1—N. W. Shovel, ¾ c.y., Diesel, Backhoe—40' Crane, Dragline, new Aug. 1948
1—Allis Chalmers Tractor Model HD19H, new May 1948
5—D W 10's—used 2500 hours
1—Caterpillar Auto Patrol #12—9K4626
1—Caterpillar D8 Angledozer #8R8933
1—Caterpillar D7 Bulldozer 4T5988

WILLIAMS CONSTRUCTION CO.
Box 145, Middle River, Baltimore 20, Md.
Phone: Essex 1310

FOR SALE

One D8 tractor, Serial No. 1-H-2221, with LeTourneau double drum P.C.U.

One Super-C Tournapull, Serial No. C-3T-2405.

One L. P. LeTourneau scraper, Serial No. S-8913.

A. B. LYNCH COMPANY
740 N. Plankinton Ave.,
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FOR SALE

1 used Model LS85 ¾-yd heavy duty Link-Belt Speeder with shovel and dragline attachments. In good running condition.
1 D4 ¾-yd Speeder shovel with "Caterpillar" D8800 diesel motor. Priced to sell.
1 K-14 Insley shovel. Like new.
1 Model LS40 Link-Belt ⅝-yd with shovel and dragline attachments. In good condition.

RIHM MOTOR CO.
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Used Equipment for Sale

Located at
Ray Construction Company Yard—
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SUBJECT TO PRIOR SALE

1—Kinney Asphalt Distributor, 812 gal., mounted on Mack Truck.....$4,000.00
1—Etnyre Asphalt Distributor, 708 gal., mounted on 1½-ton 1946 Dodge Truck 4,000.00
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1—Barber-Greene Finishing Machine, Model No. 879A, Serial No. 879-6-28.... 7,000.00
1—5-8-ton Galion Tandem Roller, Model "R," Serial 23260 .....2,250.00
1—Rotary Broom and Blower, engine driven 750.00
1—Hough Universal Rotary Broom and Blower, Model "C" with 84-inch Broom 1,000.00
1—Burch Car Unloader, Model SO, Serial 4430..... 1,500.00
1—Car Puller, Tulsa Winch mounted on 1942 Chevrolet Chassis..... 650.00
1—1,600-gal. insulated Tank mounted on 1941 Ford 1½-ton Truck, Motor No. 99T-448390 and semi-trailer..... 1,000.00
1—1,600-gal. Tank mounted on 1943 Dodge 1½-ton Truck and semi-trailer.. 1,500.00
15—Aggregate Truck Spreader Boxes— 50.00 ea.
1—Caterpillar 40 Tractor, Serial 3G268 ..... 1,000.00
1—Caterpillar 40 Tractor with LaPlant-Choate Bulldozer, Serial No. 3G1458 ..... 2,500.00
1—P & H, Model 150, ½-yd. Shovel with Dragline and Clamshell attachments, Serial No. 4858..... 4,000.00
1—Mack Truck, 3-ton, 1941, with Heavy Duty 8-wheel 25-ton Semi-trailer 2,500.00
1—Adams Model 311 Motor Patrol Grader 3,500.00
1—Caterpillar No. 11 Motor Patrol Grader 3,500.00
3—Koehring WHD 125 12½-yd. Tractors & Scrapers, Serials 1515 -16 -17.....6,500.00 ea.

CEDAR RAPIDS ASPHALT PLANT

ONLY DEMONSTRATED—$4,000.00

WALKER LILLER
R.F.D. No. 5, Cumberland, Md.

FOR SALE
AT A RIGHT PRICE:

1—Sterling Diesel Tandem Tractor with a new H.B. 600 Cummings Motor. Tractor completely rebuilt two months ago by Sterling Motors.
1—90 Ton Rogers "I" Beam Trailer.
1—D3 1947 Ward La France Standard Tractor.
1—25 Ton 1947 Lilly Low-Boy Trailer with eight 825-15 tires.
1—D3 1947 Ward La France Tractor with 5 Speed Main Transmission, 3 Speed Auxiliary, Low Speed Timken rear end. 1200x20 tires.
1—1947 Fruehauf 50 Ton Low-Boy Drop Deck Trailer with 16-750x18 tires.
1—Rogers Low-Boy with 80 Ton Drop Deck. 750x18 tires.
1—Dorsey High-Trailer, Flat Deck, 35 feet long using 1100x24 tires.
1—25 ft. Fruehauf High Trailer, flat deck with 1100x24 tires.

WANTED:

1—Model 32 Hanson Shovel Front.
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T. J. Kilmain Sales Co.
North Mt. Vernon Ave.,
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Derricks, cranes, hoists, rigging specialties; winch trucks, pickups, jeeps; welding machines, acetylene torches; air compressors; pneumatic hammers, chippers and drills; electric saws, drills, drill presses, and grinders; pipe threading machines and tools; wheelbarrows, concrete carts, concrete buckets, vibrators, pumps, rod benders, shears; etc.—for BARE BASIS RENTAL.

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Charges are for rental only, plus our direct costs of handling, shipping, maintenance and reconditioning. Rental by written contract, with minimum rental period, on a monthly basis. Credit references will be needed at the time of inquiry.

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Unit Full Rev. Shovel, $1750
Bay City ⅝-yd. Dragline
Vulcan 3000-lb. Drop Hammer
Bulldozer on RD7
3300-lb. Frost Ball
Butler Carscoop

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1 AC-HD-10 No. W3444, with D. D. Power Control	$4975.00
1 AC-HD-10 No. W4066, with Buckeye Cable Dozer	5700.00
1 AC-HD-10 No. W3657, with D. D. Power Control	4975.00
1 HD-14 with Double Drum Power Control Unit	7450.00
1 HD-14 with Double Drum Power Control Unit and Dozer	7995.00
1 Adams #51 Motor Grader, Tandem, Rubber Excellent	4495.00
1 Cat #11, Motor Grader, No. 9F204	3995.00
1 Speeder, Mod. AB03, No. A.B. 120 Shovel	4995.00
1 Austin-Western 8-Ton Tandem Roller	1975.00
1 Austin-Western No. 77 Motor Grader, Tandem, New Rubber	1475.00
1 AC-AD Motor Grader, No. 1F72, Excellent Rubber & Condition	6995.00
1 Lycombing 285 Engine	120.00
1 8-10 Yd. Garwood Cable Scraper, Model 511	2495.00
1 101 Gallon Motor Patrol, UD-14 Int. Diesel Engine, M5109	4995.00
1 HD-14 with Double Drum Power Control Unit, New Tracks	6450.00
1 HD-14 with Double Drum Power Control Unit & Dozer, New Tracks	7250.00
1 Chevrolet Army Dump Truck, with Winch and Gin Pole, New Paint, Motor and Rubber in Excellent Condition	1095.00
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Will Work Special Price for Cash on Entire Lot
All in Excellent Condition F.O.B., Fort Worth, Texas

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Allis-Chalmers HD10W bulldozer with Baker blade. 18 months old and in A-1 condition.

NEW Allis-Chalmers HD7W with Gar Wood blade.

Both units are working

GARDNER BROTHERS
Ridgefarm Illinois

FOR SALE

Lorain "40" dragline with Shovel front, ¾ yd. bucket, completely overhauled. In excellent condition. Sale necessary to settle estate of Samuel C. Van Horn, Heyworth, Illinois.

LOUIS L. WILLIAMS, Admr.
Unity Building
Bloomington, Illinois

FOR SALE

120 ton Fairbanks Morse
RAILROAD TRACK SCALE
Standard Gauge—48′ platform
NORDBERG TRACK SHIFTER
Model "S"
powered by 40 HP gas motor
JORDAN SPREADER CAR
Standard Gauge
IRON & STEEL PRODUCTS, INC.
13474 S. Brainard Ave., Chicago 33, Illinois
"ANYTHING containing IRON or STEEL"

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NORTH WEST 7 Dragline
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BUCYRUS ERIE 38B Comb. Vackhoe & Dragline
BUCYRUS ERIE 10B Vackhoe & Dragline
BUCYRUS ERIE 33B Dragline
CATERPILLAR D6 with High lift

L. M. KELLER & SON
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FOR SALE

1—Allis-Chalmers HD10 Tractor with 8′ 6″ dozer blade and Twin Buckeye hoist in excellent condition.

1—"Caterpillar" D4 with Trackson 12 ft. pipe laying side boom in good condition.

Both of the above can be delivered immediately—for further information

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Heavy Duty Air Cooled Engines for dependable power to fit the machine and the job - 2 to 30 H.P. Sales - Service - Parts - Rebuilding parts and engines in Minneapolis stocks for immediate delivery.

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LeRoi and Twin Disc Parts

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Shield Bantam ⅓ yd. shovel, Backhoe, 45' crane boom with clam bucket mounted on G.M.C. 6 x 6. New in March '48

C 90 Autocar tractor

16 yd. Truck engineering Dump trailer

30 ton Acme low bed trailer

3500 sq. ft. Atlas concrete forms steel 4', 7' & 8'

All in good shape working now

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New or Rebuilt

Sale or Rent

Headquarters for REPAIRS—any make. Factory service. We will also buy your old instruments or take them in trade.

A complete line of engineering Instruments and Equipment for Field or Office. Write for Bulletin RS-92.

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Manufacturers of Sterling Transits and Levels
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10,000 Ft.—4-Inch Pipe
Grooved Ends for Victaulic Couplings

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FOR SALE

1—Caterpillar D-7, Serial No. 7M-170SP, Hour Meter Reading since completely reconditioned 1739. equipped with LeTourneau Dbl. Drum P.C.U. and a LeTourneau Angle Dozer, with a Wooldridge BBU Carryall Scraper, equipped with 1800x24 tires, Scraper has been used about 75 days. Priced as a unit.....$14,000.00

1—Caterpillar D-4, Serial No. 5T2636W, Hour Meter Reading 2428, equipped with T-4, Traxcavator, one ¾ yd. Bucket, one 1 yd. Bucket and a Bulldozer Blade. Priced at.....$5,000.00

1—Adams 412 H Motor Grader, Serial No. 2995, Hour Meter Reading less than 800 Hours. Priced at $7,000.00

1—Adams Model 11 Elevating Grader, 19 ft. Carrier, Int. 6 cylinder Gas Motor, near new condition, priced without belt at.....$2,250.00

1—AC Model L Tractor with LeTourneau Dbl. Drum P.C.U. Overhead Gantry and Straight Dozer Blade, Very Good Condition, Dozer slightly used. Priced at..... .....$4,500.00

1—New International TD-9 Tractor, equipped with Bucyrus Erie Hydraulic Dozer, all accessories are Heavy Duty Rock Type..... .....List Price

1—Buckeye Wheel Type Trenching Machine with 5½ ft. by 26 inch wheel, Good Mechanical Condition. Priced at $1,500.00

1—General Heavy Duty ¾ yd. Dragline, equipped with 35 ft. of boom, also one 10 and one 15 ft. boom extension, equipped with a 5 kw LeRoi Light Plant and a 1 cu. yd. light weight Page Dragline Bucket. This machine is in excellent condition. Priced at $6,500.00

2—Brand new Model TS ¾ yd. Hendrix Dragline Buckets. Priced at ..... $500.00 ea.

1—Slightly used LeRoi 5 kw Light Plant $325.00

1—Gar Wood Dbl. Drum P.C.U., Model CUU2 for D-8, D-7 or D-6 Cat ..... ½ Price

1—Gar Wood Hydraulic Unit for AC HD-7 Cat, used but good. Priced at $175.00

1—LaPlant Choate C108 Scraper..... ..... $4,000.00

1—Gar Wood Model 400 Carryall Scraper with Model 400 Control Unit. Condition Very Good..... ..... $2,500.00

1—AC Model L Tractor, Condition Very Good, with special low Transmission $2,850.00

1—Sauerman ½ yd. Bucket, like new $125.00

1—1946 Int. ½ ton Pick-up, Condition good $1,000.00

1—Int. DR50 Tractor with IHC 361 inch Red Diamond Motor, F54C Transmission, 1000 x 20 tires, equipped with Model 30 Tulsa Winch, and 25 ton Tandem Axle Lowboy Trailer, Equipped with 8 900x15 tires.....$4,250.00

1—John Deere Heavy Duty Grub Plow, Like New, 24 inch..$450.00

1—Int. W-9 Tractor, 128 Hours..... ..... $3,400.00

ALL PRICES ARE F.O.B. COUNCIL BLUFFS, IA., AND SUBJECT TO PRIOR SALE

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Complete Highway Paving Outfit: Paver, Finisher, Spreader, Forms, Bins, Roller, Subgrader, Form Tamper, Etc., Etc.

FOR SALE

Jaeger 16 EL Mixer, 310 C F Compressor, Rubber Tired Roller, Pumps, 2" to 12" 5 K.W. Light Plant, Lorain 40 with Shovel Dragline & Backhoe attachments.

L. F. COLLIGNON
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Bargain LOGWASHER

Portable EAGLE, Brand New, 7' x 20' tub. Twin Paddles 36" x 20'. Mounted on tandem steel wheels, single dolly front. Priced at less than half of reg. new price.

10-ton DIESEL TRUCK

FEDERAL, Cummins HB-600 150 H.P. Diesel. Ten each 10:00 x 20 14 ply tires. Timken rear end with overdrive transmission. 95% new. 3600 miles. $5,750.00.

FWD New TRANSMISSION

Also Transfer Case. #21438. #13375. Reg. price $1450.00. Our price $500.00.

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2136 Jefferson Street Kansas City, Mo.

FOR SALE

1 Batching Plant

3 YD. COMPLETE WITH BLAW KNOX AGGREGATE BINS, SCALES, 2 450 BBL. CEMENT STORAGE BINS WITH ELEVATOR AND SCREW TYPE CONVEYORS, AND 1 UNLOADER, CEMENT BULK, SCREW TYPE, COMPLETE WITH 2 ELECTRIC MOTORS.

PRICE ON REQUEST

ALSO OTHER TYPES
OF EQUIPMENT AVAILABLE

C. F. RULE CONSTRUCTION CO.
217 - 13th Ave. No.
P.O. Box 517
NASHVILLE, TENNESSEE

FOR SALE

1—300 Bbl. Blaw-Knox Cement Bin with one yard batcher under car unloader
Chain Bucket Elevator
Gasoline Motor
Air Compressor
Electric Vibrator

1—3 Compartment 192 ton Johnson Aggregate bin with 2 yd. batcher Baumann under our aggregate unloader, 5 H.P. Electric Motor, Electric 10 H.P. Motor
Chain Bucket Elevator

2—27E Foote Pavers

8—3 H.P. Gasoline Muster Vibrators

5—3 H.P. Gasoline Mall Vibrators

4—Sullivan Single Drum Air Hoists

2—Sullivan Pitonair Motors

2—½ yd. Blaw-Knox Buckets

2—Complete steel member 65 ft. head frame structures for shaft sinking

2—Jaeger 3 yd. Transit Mixers mounted on G.M.C. Trucks

G. L. TARLTON CONTRACTING CO.
WEST PARK AT MANCHESTER AVE.
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12 Garwood "511" 8-11 yd. cable scrapers, 6 1400x20 tires, NEW WAR SURPLUS, repainted and new cable. More than $2000.00 less than current price, each.
1 Used Garwood "515" 12-15 yd. cable scraper, 1800x24 tires ..... $ 4000.00
2 Used LeTourneau "F" 12-15 yd. scrapers ..... 4000.00 ea.
1 D-8 Tractor, serial 1H4144, 8-R PCU, very good 12500.00
2 RD-8 tractors (converted to D-8), Let. 8-R PCU, with LeT. cable dozers, very good ..... 12000.00 ea.
1 Garwood Cable angle-dozer for HD-14 tractor 1000.00
2 "Low Boy" Trailers, 35-40 ton, tandem axles, 100x20 tires. NEW.... 3500.00 ea.
6 1400x24 20 ply tires and tubes, NEW 175.00 ea.
2 1400x24 16 ply tires and tubes, NEW 170.00 ea.
4 1300x20 12 ply tires and tubes, NEW 110.00 ea.
4 1200x20 12 ply tires and tubes, NEW 85.00 ea.

W. C. SCHNEIDER COMPANY, INC.
5641 Colfax Ave. So.,
Minneapolis 19, Minn.
Telephone: Regent 6713

FOR SALE

2—DW 10's with LaPlant scoops—good condition.

1—D 7 tractor, cable dozer—good condition.

1—R D 7 Tractor—Hydr. Dozer—good condition.

2—Super C Pulls—fair condition.

2—C type Pulls—Completely rebuilt.

1—Tournadozer, near new—A1 condition.

1—HD 14 Tractor & Garwood Scoop Hyrd.

All priced cheap for quick sale

R. J. RYAN, INC.
Council Bluffs, Iowa

CATERPILLAR TRACTOR,
Model 30 PS Series w/side boom.
CATERPILLAR TRACTOR,
Model 20, PL Series w/end winch.
AUTO CAR 1943
Model U7144 w/Enclosed Cab.

BOILER TUBES
PIPE
GAS ENGINES
MACHINERY

BRADFORD SUPPLY COMPANY
WAYNE, Wood County, OHIO — Near Toledo

For Sale

1942 I.H.C. KR11 truck tractor, with 1946, 150-h.p. Cummins engine, air brakes, electric sanders, saddle tanks and new fifth wheel. This truck is in first class shape and will make the party who needs such a heavy tractor a good deal.

VICTOR SCHILLER
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1942—1¾ YD. LORAIN, Model 80

Serial #11457. Standard Shovel Front and Second Drum Attachments Complete. Machine Completely Rebuilt—Available December 10, 1948.

1946—¾ YD. KOEHRING, Model 304

Serial #5058. Combination Crane, Drag, Shovel and Backhoe.

Above subject to prior sale

J. H. BEERS
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IMMEDIATE DELIVERY FROM STOCK

182 Pcs.	4" W. F. Beams	13.8#	40'-0"
429 Pcs.	6" W. F. Beams	20#	40'-0"
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51 Pcs.	10" W. F. Beams	49#	40'-0"
38 Pcs.	12" W. F. Beams	65#	40'-0"
32 Pcs.	14" W. F. Beams	115#	55'-0"
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LARGE TONNAGE, BEAMS, CHANNELS, ANGLES, PLATES AT BOTH OUR EAST COAST AND WEST COAST WAREHOUSES.

LONG ISLAND BEAM CO.
39-25 21 St., Long Island City 1, N. Y.
Stillwell 6-5900-1-2-3

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18—**THOR** Air Reamers, Wood borers up to ⅞ in. reaming, 2 in. wood borings, NEW. Government surplus. Less than ½ present price.
Also Drill Bits for the above.

A. F. DEANEY COMPANY
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1—3x6 type 58 3-deck vibrating screen used but good as new—available any time.

LOUIS MARSACK & SONS
Sand and Gravel
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FOR SALE OR RENT

602 Lima combination Shovel and Dragline, Shovel boom 22 ft. with 17 ft. stick, Dragline boom 65 ft. Machine completely overhauled.

MERRITT & MERRITT
P. O. Box 130, Harrisburg, Ill.

FOR SALE

4'x16' Open end tube mills (3)
Air compressors
All steel dredge boats, scows, tug boats and pug boats
Chicago Pneumatic Simplex vacuum pump with receiving tanks and valves
Steel Bins and hoppers
Fuller-Kinyon pumps 5" and 6"
Dry pan mill
Belgian flint grinding pebbles (11 tons)
6'x50' Manitowac Dryer (1)
Richardson automatic scale
B & W Foster-Wheeler express type boilers generating at 100%, 122,-500 lbs. steam pressure per hour
1 Yd. and 1¼ Yd. Clam-shell buckets
4 Wood hoppers lined with steel

OLLIE E. LAWRENCE
BOX 688
QUINCY, MICHIGAN

FOR SALE

4—Tournapulls—2 new & 2 used LeTourneau model D with G Scrapers & AD Tiltdozers. Reasonable.
1—Tractor-Scraper—AC model L crawler with Garwood S-8 Scraper—Bargain.
1—Ditcher—P&H model 20/42 gas. Good condition.
1—Aggregate Dryer—Barber-Greene model 831 on semi-trailer. In new condition.
Hoists—Single & Double Drum gas powered. Clamshells—½, ¾ and 1½ cu. yd.
3—Trucks—2 Ford Truckstell with 6 yd. Galion end dump Rock Bodies. 1 International with 2,000 gallon tank, pump & sprayers.
1—Turbo-Generator—GE 500 KW 3/60/2300 with Condenser.
1—Diesel Generator—Caterpillar D-4600 with 30 KW 3/60/120-208 GE 1200 RPM Generator.
4—Air Compressors—1 used 315 cfm IR diesel powered on steel wheels, two 60 and one 88 cfm new Stationary Worthingtons with 3/60/440 motors. Ventilating Fans—New 8,000 & 16,000 cfm Buffalo Forge Company with 2 speed AC motors.

COLUMBIA ENGINEERING EQUIPMENT COMPANY
Columbia 1, South Carolina **Phone 5851**

FOR SALE

1—Davey Model 105 Air Compressor, Serial T-1133, Comp. 2-2630, year 1943	$ 750.00
1—Gallion Model 401 Road Grader, Serial M-2543, Year 1941	1,400.00
1—Gallion Model 401 Grader, Serial E 88142, Year 1946	2,000.00
1—Caterpillar D-4 Bulldozer, Serial 5 T88W, Year 1945	3,500.00
1—International T-9 Bulldozer, Serial TCB 2648, Year 1941	3,300.00
1—P&H Truck Crane, Serial 10584, year 1946, with 25' standard boom, 5 & 10 foot boom sections and fair leads for dragline	$13,000.00

The above equipment is all in good operating condition, and prices are F.O.B. Cleveland, Ohio.

CLEVELAND CONTRACTORS EQUIPMENT CO.
12500 Berea Road **Lakewood, Ohio**

34E. REX
DUAL DRUM PAVER

Used on one job as stationary mixer. Perfect condition. Less than half price.

R. W. GEORGE CONSTRUCTION CO.
34 North Gore Ave.
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WANTED

Rotary kilns: Size 11', 10', 9', 8', 7' and 6' dia. 100' or longer.
Compeb mills: 6' and 7' dia.
Tube mills: 5', 6' and 7' dia.
Jaw crusher: 7" x 9".
Ball mills: 7' in diameter or larger and 8' in length or longer.
Slurry filters, drum or disc type.
Steel tanks 14' in dia. x 12' to 25' or longer with ¼" or ⅜" plate.
Bradley Junior Pulverizer.

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Sales Manager with mechanical background and proven ability in promotional sales, planning and advertising and who has sold hydraulic hoists and bodies for trucks and equipment used for earth moving purposes. Give full particulars in first letter.

Write Box 1008 Roads and Streets, 22 W. Maple St., Chicago 10, Illinois.

FOR SALE

1 Barber-Greene Loader, Model 545 —Reconditioned. Mounted on rubber.
1 D7 Caterpillar w/bulldozer
1 Cedar Rapids Jr. Tandem straight line crushing plant w/10x36 jaws —Reconditioned.
1 LS85 Link Belt Speeder dragline —45 boom, ¾ cy bucket and shovel front.

ELMER LARSON, INC.
Malta, Illinois

Used Diamond No. 65 Dual Crushing and Screening Plant

Consisting of 1036 Jaw, 3018 Roll, 48 x 10 D.D. Vibrator, 40 ft. x 24 inch Conveyor, D-13000 Caterpillar Power Unit. New in 1945 and in excellent condition.

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250 10th Ave. S.
Minneapolis 15 Minnesota
Geneva 0387-0388

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Allis-Chalmers Model HD-10W Long track diesel tractor with Gar Wood cable tip-dozer and double drum cable control unit. 1948 model like new.
P & H 1 cu. yd. Dragline model 455-A, 1947 Model, Serial # 11044. This machine is equipped with Buda diesel engine and light plant. 50 foot boom and 1 yd. bucket. Like new.
Koehring Model 304 ¾ cu. yd. dragline and pull shovel combination, equipped with 40 foot boom and Buda diesel engine. This machine used one season and like new.

NODLAND-ALBERG CO., Starbuck, Minn.

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Contractors desiring to do resealing work of expansion, contraction and other types of cracks in paving and monolithic construction with rubberized bituminous material ZERO-LASTIC, a compound which will maintain seal at zero degrees temperature—a lucrative contracting business. For particulars, write to:

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We have the parts for your army trucks.

Fill out and mail the attached coupon for free "Parts and Price Lists."

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MAIL FREE PARTS AND PRICE LIST TO

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WE OPERATE THE FOLLOWING ARMY TRUCKS

.....Jeep .....Chevrolet 1½ ton 4x4
.....Dodge ½—¾—1½ ton 4x4 (Circle Capacity)
.....GMC 2½ ton 6x4 or 6x6 Banjo Type Axle
.....GMC 2½ ton 6x4 or 6x6 Split Type Axle
.....Studebaker or Reo 2½ ton 6x4 or 6x6
.....International M-5H-6 2½ ton 6x6

FOR SALE

Link-Belt Speeder "LS-85" ¾ yd. dragline, equipped with "Caterpillar" D-8800 diesel engine, 24" tracks, IRBH 35' box boom, sheave type fairlead, 5' boom extension, and counterweight. New in 1946

Universal 880 Jr. Portable Gravel Plant equipped with D-8800 "Caterpillar" diesel engine, 1024 roller bearing Jaw Crusher, 2416 Roll Crusher, 3 x 8—2½ deck simplicity screen, 24" feed conveyor, sand conveyor, tandem axle, dual wheels, pneumatic tires. New in 1946.

LIVERPOOL MATERIALS CO.

Contact Oscar Linn

Phone 577-W Canton, Illinois

FOR SALE
BY CONTRACTOR AT DEPRESSION PRICES

1—Caterpillar D7 with Le Tourneau Cable Dozer
1—Caterpillar 50 Diesel with Athey Hydrolic Dozer
1—Bucyrus Erie 1 yard Combination Shovel Crane Model GA-2
1—Northwest Crane 1¼ yd. Model 104
2—Godfrey 30 ft. x 24 inch Belt Conveyors with 4 Cylinder Wisc. Air Cooled Engines.
2—Mortar Mixers
1—12-inch Worthington Gatewater Valve (new) and other Builder and Excavators Equipment too numerous to mention

All Equipment in Good Working Condition

GEORGE J. BEEMSTERBOER
11732 Yale Ave., Chicago 28, Ill.
Pullman 5-6000

MILES and TESTA

Delta Shipyards New Orleans, La.
Industrial Canal

ARMY SUPPLIES

50 SHOVELS and CRANES

12 Limas ¾ yard capacity, Model 34
1 Byers Crane, ¾ yard capacity
5 Korings, ¾ yard capacity, Model 304
1 Link Belt, ¾ yard capacity, Model L-85
3 P & H ½ yard capacity, Model 150
5 P & H ¾ yard capacity, Model 250
16 Buckeyes, ¾ yard capacity, Model 70
4 Bucyrus-Erie Model 15-B
2 Bucyrus-Erie Model 22-B
1 Northwest Model 25

Also available, Clam and Drag Line Buckets

Above machines priced to sell at 50% of current prices on an as-is basis, f.o.b. cars, New Orleans.

Replacement of minor motor parts and motor repairs and cab reconditioning will put the machines in a "like-new" condition.

Also arriving January 20th are the following:
4 D-7 Caterpillar dozers
1 D-6 Caterpillar dozer
1 D-4 Caterpillar dozer
1 TD-9 Dozer

SHIPMENT DUE TO ARRIVE DELTA SHIPYARDS, NEW ORLEANS, BY JANUARY 20—WRITE OR WIRE CARE OF THE ABOVE.

Also available:
1 2-yard Osgood Shovel-Crane Combination, Wakashaw Engine, long cats, as is, $20,000 f.o.b. New Orleans
1 2-yard Lorraine Model 82 Shovel. (This machine like new.) $25,000, located in New York.

FOR SALE

1—4x8 triple deck New Holland inclined vibrating screen, nearly new, $1300.
2—100 H.P. UD-18 Int. diesel engines. Each $1375.
2—75'x24" Iowa greaseless troughing roll channel conveyors complete with speed reducers, less belting, each $1275.
1—Two-wheel C-61 five-yard LaPlant Choate Hyd. scraper, $500.

DILLON, SHARPE & CO., Columbus Jct., Iowa

SPACE HEATERS

War Surplus Bargain

New—Ready To Use!

40,000 BTU capacity

—Burning gasoline, kerosene or diesel fuel.
—Electric blower—12 V. DC or 110 V. AC using small transformer.

Portable, Quick, Clean Heat

Ideal for curing room, concrete plants, work under construction, emergency heat, or auxiliary heaters.

$95.00 each

Crated in Original Export Boxes

Clapp, Riley and Hall Co.
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Chicago 7, Illinois

FOR SALE

1¾ yd. Lima 701 crane-shovel-dragline. Superior diesel, overhauled. 60 ft. bm. Bargain.

1½ yd. Lima 601 Crane-shovel-dragline. Caterpillar D-13000 engine. 70 ft. bm. Excellent shape.

25 ton Wiley steel stiffleg derrick. 60 ft. bm., 30 ft. mast. Condition new.

Steel Sheet, Piling & Pile Hammers Bought, Sold & Rented

Mississippi Valley Equipment Co.
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SEWER ENGINEER

Must be capable of Designing Sewers from field notes—$5200.00 a year—also need good detail draftsman.

Phone or Wire

M. G. "OLE" JOHNSON

City Engineer Indianapolis, Indiana

SOME REAL BARGAINS IN USED CONSTRUCTION EQUIPMENT

1 Caterpillar 8R Series D8 Tractor with LeTourneau Model LU Scraper, Rebuilt in our shop.
1 Caterpillar Late D7 Tractor with T7 Traxcavator completely rebuilt in our shop.
1 Caterpillar No. 11 Diesel Tandem Drive Motor Grader W/cab, snow plow and wing, Rebuilt in our shop.
1 Austin-Western 99 Motor Grader W/cab, lights, starter and dozer blade. Rebuilt.
1 Caterpillar 48" Elevating Grader W/Gas engine. Good condition.
4 Caterpillar DW10 Tractors W/Caterpillar W10 Wagons. Good Condition.

Many other bargains in Tractors, Motor Graders, Scrapers, Etc.

Further details and prices furnished upon request.

GIBBS COOK TRACTOR & EQUIPMENT CO.
1314 WALNUT DES MOINES, IOWA

OWNER'S OFFERING

Subject to Prior Sale

Located at St. Paul, Minnesota:
1—52-B Bucyrus-Erie diesel Crane-Dragline-Shovel combination
1—Robins Gyrex 4' x 10' double-deck Vibrating Screen
1—LeRoi 6-cyl. 160 H.P. gasoline Power Unit
1—Model 50 Caterpillar Tractor, diesel, with 10' bulldozer

Located at St. Cloud, Minnesota:
1—14" Superior McCully gyratory Crusher
1—10" Superior McCully gyratory Crusher

J. L. SHIELY COMPANY
1101 N. Snelling Avenue
St. Paul 4 - - - Minnesota

EMMETT C. WATSON CO.

Contractors Equipment

Lima Type 603 Shovel, 1½ cu. yd. bucket; Waukesha-Hesselman Motor; Crane Boom; S/N 1076.

Northwest Model 6 Shovel; 1½ cu. yd. bucket; 25' boom; 18' stick; 1500 W Kohler light plant; D-13000 Caterpillar diesel engine. S/N 8975-6751B.

Lorain Model L820 Shovel; 2 cu. yd. bucket; 23' boom; 18' stick; D-13000 Caterpillar diesel engine; air crowd; S/N 18307. Used ten days.

Caterpillar D8 Tractor with P.C.U. & Blade; S/N 8R185 (LeTourneau Angle Blade).

Caterpillar D8 Tractor with P.C.U. & Blade; S/N 8R8946 (LeTourneau Angle Blade).

Caterpillar D8 Tractor with P.C.U. & Blade; S/N 1H5734SP (Le Tourneau Angle Blade).

Caterpillar Model 12 Motor Patrol Grader; S/N 8T863. Used very little.

1—D 13,000 Caterpillar Diesel Engine completely overhauled in new condition with Automatic Group, $4,500.

Northwest Model 80-D Dragline; 3 cu. yd. bucket; S/N 8566.

Northwest Model 8 Dragline; 3 cu. yd. bucket; S/N 6254.

Northwest Model 5 Shovel; heavy duty type; 1½ cu. yd. dipper; 50' boom; gantry; fairleads; 1½ cu. yd. Hendrix bucket; New cab and new paint; S/N 4589. Price $17,500.00.

Location: Eastern Kentucky—Condition: Excellent. Prices on application. Subject to prior sales.

310 E. Brandeis St., Louisville 8, Ky.
Phone: CAlhoun 5373
SALES—SERVICE

Hydro-Korpak.
Semi-automatic, single block.
Purchased Feb. 1948. Will be factory rebuilt for the purchaser.
Rubber tired racks, pallets for 1500 blocks, 8" and 12".

JENISON BRICK & BLOCK CO., INC.
Jenison, Michigan

FOR SALE

1 1-yard Page Dragline Bucket like new, $300
1 RD 7 Caterpillar with LeTourneau Angledozed and PCU
2 NEW Lessman ¾ yd. front end loader. These are a buy at less than factory cost.

We also have a large assortment of spare Caterpillar and International parts for most sizes of tractors.

TRI-STATE EQUIPMENT CO., INC.
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FOR SALE

F. C. George Hydraulic 2 Unit, 3 Cell Block Machine with self feed hopper and all attachments for 8", 4" and 12" block.

WILL SELL AT REDUCED PRICE

MADISON BLOCK CO.
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Badger 6559

STEEL SHEET PILING

2000 Pcs. BETH. SP4—35 to 42 ft.
1300 Pcs. BETH. DP2—20, 40, 60 ft.
700 Pcs. BETH. Z32—32 ft.

STEEL STORAGE TANKS

2—74,000 Bbl. Cap. 114x40
8—10,000 & 15,000 Gal. Horizontal

DARIEN CORP., 60 E. 42nd St., N. Y. 17, N. Y.

ROTARY TYPE SNOW PLOW

Rotary snow plow—straight blade, for mounting on 5 ton truck, 8½ ft. moldboard set at 45 degree angle —6-ft. wide path. Mfg. by Snow Removal Equipment Co.—power unit Ford V-8 85 h.p., w/cooled, w/generator and starter motor. Chain drive thru remote control, hydraulic operated transmission. With attachments for mounting. Used less than 100 hours. Priced to sell.

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Did you say your transportation was impossible, too costly or just plain tough?

Before you throw up your hands call U.S.A.C. headquarters and let us check it over with you. If we don't handle it to your entire satisfaction, the best box of cigars in the house is on

U.S.A.C. TRANSPORT, INC.
Dover, Delaware Phone 5791

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(2)—Truck Mixers—4½ yard Hi-discharge—Bought new May 1947—Rex make
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(3)—Truck Mixers—5½ yard horizontal type—Bought new Jan. 1943—Rex make

GENERAL SAND & STONE CORP.
P. O. Box 97 Elmwood 10, Conn.

FOR SALE

One 10-B shovel—Serial No. 14242 with trench hoe, dragline boom and bucket complete.
One 10-B shovel—Serial No. 13326 with trench hoe, dragline boom, no fair lead or bucket.
One Caterpillar Tractor, D-4, with straight dozer, wide gage No. 2T 7225.

W. S. MOORE CO.
Brooklyn Road Hibbing, Minnesota

FOR SALE

We have several Dozers and Cranes. Let us know your needs in any equipment.

ANGOLA EQUIPMENT CO.
Box 209 Angola, Indiana
Phone 917Y

Inquiry Blank

Check items of equipment or materials on which you wish to receive information. Give your name and address in the space at foot of page (if convenient, please print or use typewriter), detach and mail to ROADS AND STREETS, Readers' Service Department, 22 West Maple Street, Chicago 10, Ill. We will pass your inquiry along to manufacturers and see that you get desired information promptly.

Check products below on which you wish us to obtain information for you:

I AGGREGATE:
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3 Crushers
4 Portable Plants
5 Screens

II BITUMINOUS:
6 Batchers
7 Finishers
8 Distributors
9 Dryers
10 Heaters
11 Plants (central)
12 Plants (travel)

III CONCRETE:
13 Batchers
14 Buggies and Carts
15 Finishers
16 Joints, Expansion and Contraction
17 Mixers (under 1 yd.)
18 Mixers (1 yd. up)
19 Pavers
20 Reinforcing Steel
21 Road Forms (1000' set)
22 Tower
23 Truck Mixers

IV CRANES:
24 Crawler Mounted
25 Truck Mounted
26 Piledrivers

V GRADERS:
27 Blade, self propelled
28 Blade, pull type
29 Blade, under truck
30 Elevating

VI LOADERS AND TRENCHERS:
31 Front-end loader (tractor mounted)
32 Loader, bucket type and belt type
33 Trencher or Ditcher

VII HAULING EQUIPMENT:
34 Dump Truck
35 Other Trucks
36 Dump Wagons, tractor drawn
37 Flatbed Trailers

VIII PUMPS:
38 Centrifugal
39 Diaphragm
40 Piston

IX POWER UNIT:
(Independent)
41 Gasoline
42 Diesel
43 Electric

X ROLLERS:
44 Power (Smooth)
45 Pneumatic Tire
46 Sheepsfoot

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47 Crawler
48 Rubber Tired

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49 Bulldozers
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51 Rippers
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XIII BUCKETS:
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57 Orange Peel

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60 Truck Mounted

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64 Concrete Vibrators
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66 Drills, tripod and wagon
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69 Paving Breakers
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75 Mowers, Highway
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80 Street Sweepers
81 Welders
82 Cutting Torches
83 Hydraulic Jacks
84 Hydraulic Control Equipment
85 Hand Tools
86 Hoists, derrick type
87 Highway Guard
88 Snowplows, rotary
89 Snowplows, v. or wing

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Title
Your Name.....or profession.....
Name of your company
or governmental department.....
Type of work for which
equipment will be used.....
Street Address.....
City..... State..... County.....

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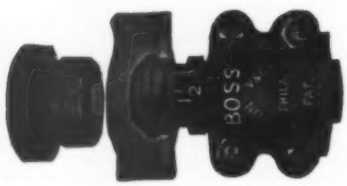

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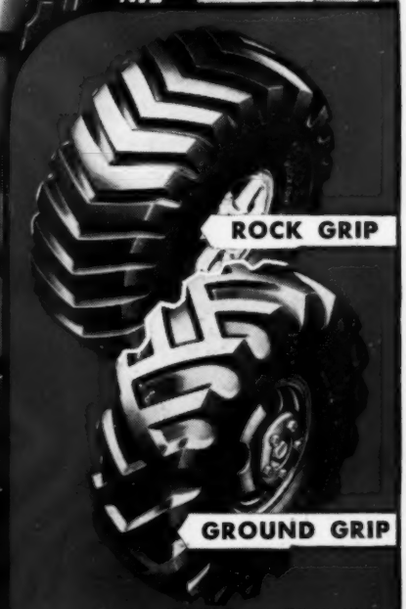

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